The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 142, NO. 9 — CHICAGO, ILLINOIS — MARCH 4, 1950

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CANCER OF THE LOWER PART OF THE GASTROINTESTINAL TRACT

Diagnosis and Treatment

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The importance of cancer of the lower portion of the gastrointestinal tract in the whole picture of cancer is highlighted by the fact that approximately 50,000 persons die in the United States each year from cancer of this segment of the bowel. Such statistics are of necessity inaccurate and probably too low. Certainly a great many times that number of persons are suffering with various stages of the disease. This is a sad commentary on the physician's ability to diagnose these cases earlier, although attention has been focused on this point for several decades. Actually, it is an indictment in part of medical practice, because many of these lesions are permitted to grow to large size and even to metastasize before an adequate examination of the patient is performed. In defense of the members of the medical profession, it must be admitted that many persons refuse to heed early signs of cancer, although the constant dissemination of propaganda and warnings concerning cancer would seem to make such an attitude impossible. The diagnosis of cancer of the rectum is simple and seldom is missed if the physician performs (1) digital examination, (2) proctoscopic examination and (3) biopsy.

The diagnosis of cancer of the colon and its localization and differentiation from other lesions of this portion of the gastrointestinal tract is not difficult for a competent roentgenologist, provided the patient has been properly prepared for examination and has a properly emptied bowel. What are some earlier symptoms of cancer of the lower part of the gastrointestinal tract? Such a question is not easily answered save in a general manner, but it seems to me that the point of irregularity of bowel habit has been belabored beyond its importance. Although the majority of persons on close questioning will admit alternating periods of diarrhea and constipation within a short period of the discovery of the growth, actually blood in the stool or on the stool in my experience has been the first symptom which the majority of patients have noticed. It certainly is the first symptom which sends them to a physician, by whom this symptom is frequently treated lightly and without examination. Bright red blood in the stool or on the stool comes from hemorrhoids and low-lying benign lesions of the bowel more often than it does from malignant growths, but the point of its importance is that it should demand an adequate careful proctoscopic and even roentgenoscopic examination if it persists beyond a short time. The large number of cancers which are fully developed and frequently have metastasized before the patient seeks medical advice emphasize the lack of a sharply defined syndrome of which one can inform the public with assurance, and which will bring patients to the physician for diagnosis of their disease much earlier. The fact that pain is a relatively infrequent early symptom is perhaps one of the most distressing factors in the entire picture, and it is responsible for delay more than any other factor.

There is a seemingly close relationship between polyps in this portion of the gastrointestinal tract and cancer. It is an old theory which was first advocated by some German observers in the early nineties, and they based their opinions on histologic observations in a variety of polyps which were excised with cancers of the rectum and colon. In 1930 Fitzgibbon and I studied thirteen specimens of polyps of the colon and rectum in which we thought we showed conclusively evidences of changes from benignancy to malignancy. This has been the experience of many other observers; coupled with the facts that 70 per cent of the cancers of the rectum and colon taken together as one unit occur from the sigmoid to the anal canal and that 71 per cent of the polyps occur in the same region, the significance is important. All polyps are not malignant, but it is customary to divide them into three groups.

Group 1 includes only growths in which the epithelium retains its normal characteristics. The tumors are usually nodular, and the epithelium overlying the growth and lining the crypts is unchanged from the standard pattern except for scattered areas which show some evidences of hyperplasia. Polyps of this variety vary from 2 or 3 mm. in diameter to masses 1 or 2 cm. on cross section. The loose connective tissues of the submucosa are pulled into a stalk. All polyps of group 1 are pedunculated.

It is easy to distinguish polyps of group 2 from those of group 1 by the abrupt changes in both the epithelium and the connective tissue elements. In group 2 there is widespread failure of the epithelium to differentiate completely into normal intestinal mucosa. The cells are hypertrophied and elongated, and their bulk compresses them from side to side. They frequently are piled up into overgrowths that make multilayered buds, which project into the lumen of the nodules and frequently into the connective tissue of the matrix as well. The nuclei, like the cells, are elongated and stain more deeply with the usual dyes. These epithelial changes do not appear equally advanced over the whole of the group, but there is usually a peripheral zone of greater cellular activity where the changed epithelium is first observed.

Read before the Section on General Practice at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 10, 1949.

There is a complementary response to the epithelium in the connective tissue of the submucosa. If the growth is not too rapid the connective tissue elements are drawn out into branching divisions, which form a treelike scaffold for the epithelial complexes. The polyps of group 2 are invariably pedunculated and frequently massive, sometimes measuring as much as 6 cm. in diameter and sometimes having a pedicle that is 4 to 6 cm. in length. Occasionally there is evidence of inflammatory reaction in polyps of this group, and areas are often actively infiltrated with round cells. It would seem that the development of cancer from polyps has some relation to the rate at which the tumor is driven to grow in the slow-growing formations of group 1 with little likelihood of cancerous changes. In the rapid growth of polyps of group 2 it seems that it is only a question of time until cancer develops.

Group 3 polyps are an extension of group 2 in type, and there is no sharp line of demarcation between the two as between groups 1 and 2. Group 3 polyps are accentuated forms of group 2 growths, in which cellular activity reaches its height. Polyps of this group must start in an overgrowth of glandular tubules in the mucosa, and ordinarily they attain only a small size. There is a lag in the connective tissue stroma in their characteristic formation, and cellular activity is the outstanding departure from normal.

All these polyps are subjected to the constant tug of the peristaltic action of the bowel and the constant trauma of the fecal current, which is hard and formed in the lower part of the canal. Polyps of any group may be single or multiple and are to be differentiated from the diffuse or multiple familial polyposis, which I think is the best example of a precancerous lesion. There is little doubt that familial polyposis inevitably develops into cancer if the patient lives long enough. Indeed, this is such a fixed axiom that all surgeons perform radical surgical operation on persons with these lesions as soon as the diagnosis is made.

SYMPTOMATOLOGY

In order to differentiate symptoms in various portions of the colon and rectum, it should be recalled that the colon is a bifunctional organ which develops from two portions of the primitive gut beyond the middle of the transverse colon. The bowel develops from the hindgut, whereas proximal to this point the colon develops from the midgut. This is important from the point of view of pathology, symptomatology and treatment.

Cancers of the ascending colon manifest themselves largely by disturbances of physiologic functions. Anemia is a prominent symptom in a certain group of cases. It is a secondary anemia not accompanied with visible loss of blood, but frequently it progresses to a serious extent before it is discovered. It is not uncommon to find that a patient who seeks medical aid because of weakness, inability to do his daily chores and complaints of paleness of the mucous membranes has a hemoglobin estimate of 20 to 30 per cent and a red cell count below 3,000,000. A hematologist by a smear can readily distinguish the type of anemia as secondary, but if one suspects a cecal cancer one may frequently make the diagnosis immediately by roentgen examination of the colon. In such deep-seated anemia one thinks of primary anemia, cancer of the stomach and bleeding fibroids. One more properly should reverse the order and think of cancer of the ascending colon, cancer of the stomach and fibroids, after a diagnosis of primary anemia has been eliminated.

In the ascending colon symptoms of obstruction (chronic, acute or subacute) predominate, and it is seldom that a cancer of the descending colon even at exploration does not show evidences after a long period of decompression of some type of obstructive phenomena. The reason for this is simple. The tumors have a tendency to grow around the lumen of the bowel, which is narrower and more muscular on the left than on the opposite side. In the ascending colon the growths are flat, seated laterally, covered with stubby, granulation-like areas and much more available for absorption than those in the descending colon.

Pathologically and symptomatically, the two halves of the colon differ materially, but after the patient with a clean bowel has had a barium sulfate enema the roentgenologist can accurately localize the lesion and recognize its pathologic type. The opaque medium should be given to the patient by enema because of the danger of producing acute intestinal obstruction if it is taken by mouth. Unfortunately this fact is inadequately understood by internists and roentgenologists, and it is the common lot of every surgeon to have to operate once or twice a year on a patient with an acute intestinal obstruction superimposed on a cancer of the colon because of ingestion of an opaque medium for roentgen ray diagnosis.

RECTUM

Symptoms of cancer of the rectum revolve around change in bowel habit and bleeding. There is small excuse for overlooking any cancer of the rectum if the patient is given a reasonably thorough examination. Digital examination with the patient in the knee-chest position and bearing down against the finger of the examiner will permit one to touch most of the cancers of the rectum. If the growth is higher and at the rectosigmoid juncture, it may always be seen by a proctoscopic examination. Although it is considered unnecessary in most cases, I like to do a biopsy on all cancers of the rectum. It is innocuous, and it adds to the accuracy of the diagnosis. Efforts to encourage persons with suspicious intestinal symptoms to seek an adequate examination should be even more forcefully employed.

Self medication and refusal of the patient to recognize that minor symptoms often indicate a cancerous lesion in an early stage account probably for more delay than does the failure of a physician to make an adequate examination. But institution of therapy without adequate examination unquestionably is a sin of omission of which the physician is too often guilty. It is certainly worth while to continue to bring to the attention of both the members of the medical profession and the laity the grave responsibility of overlooking minor intestinal symptoms such as change in bowel habit and blood in the stool or on the stool. Only by recognition of the fact that such sentential warnings will bring patients to surgery at an earlier date will it be possible to increase longevity figures. The mortality figures are satisfactory. The prognosis is good if a lesion is treated at a reasonably early stage, but unfortunately too many of them are in advanced stages before the patient is examined.

TREATMENT

The treatment of cancer of the lower portion of the gastrointestinal tract is undeniably surgical, and the utilization of radium and roentgen radiation concededly is palliative in some instances. Recent years have seen

several trends develop in surgery of the colon and rectum. Some are advantageous, some in my opinion questionable. The favorable trends are: (1) a prolonged and more standardized period of decompression and rehabilitation, (2) the utilization of single stage procedures in a high percentage of cases; (3) the allocation of chemotherapeutic agents and antibiotics to their proper place, namely, adjuncts to radical surgical procedures, and (4) the rediscovery of sphincter-saving operations—a trend which has been pressed, I believe, beyond its worthiness.

The last quarter of a century has seen a recognition of decompression and rehabilitation develop to such a point that only in the event of acute intestinal obstruction does one operate on dehydrated, desiccated cancer patients without making every effort to restore them to as nearly a normal physiologic equilibrium as is possible. The objectives of a preoperative regimen are: (1) decompression and cleansing of the bowel; (2) replacement of blood loss and establishment and maintenance of protein balance by transfusions of whole blood; (3) combating dehydration with dextrose and saline solutions; (4) establishment of vitamin concentration, especially ascorbic acid and vitamin K, and (5) use of chemotherapeutic agents and antibiotics. That this regimen, standardized and routinely utilized, has reduced the mortality of cancer in the hands of experienced surgeons to a most satisfactory level is beyond question, and it is further of importance that the extension of a radical operation, by which is meant not only the removal of the local growth but a widespread removal of gland-bearing tissues in juxtaposition to it, has enormously improved the ultimate prognosis.

The utilization of a graded operation was a step of great advantage a decade ago, but in the vast majority of instances it has been largely eliminated by the procedures outlined except in the descending colon. For my own part, I practically never utilize the graded operation in the ascending colon, transverse colon or rectum. I am not able to utilize resection and anastomosis in the descending colon in a high percentage of patients. Somewhere between 25 and 33 per cent of the patients with cancer of the sigmoid have one stage operations, but two important criteria must be observed, (1) adequate removal of bowel and mesentery and (2) actual visualization of the blood supply before the anastomosis is made. In my experience a great many elderly persons who have a large amount of fat in the mesentery are poor risks for an immediate anastomosis in this segment of the bowel, and I have no hesitation in employing a graded maneuver when it seems advantageous. Why a modern surgeon should press to accomplish an ideal operative maneuver although the operative risk is increased, is difficult to understand. Certainly a patient with a cancer has only one objective in life, and that is to get rid of the cancer in such a manner as to insure the longest period of survival.

Choice of operation in the ascending colon lies between (1) anastomosis between the transverse colon and terminal ileum and resection in one stage, (2) ileocolostomy between the transverse colon and terminal ileum and (3) resection at a second stage.

In the descending colon the choice of operation lies between (1) obstructive resection, (2) resection and anastomosis without a decompressive maneuver and (3) exteriorization (Paul-Bloch-Mikulicz).

Whether one uses a closed aseptic anastomosis or an open one is a matter of individual choice. Although theoretically a closed anastomosis seems preferable for many obvious reasons, actually the mortality statistics for the methods are comparable.

CHOICE OF OPERATION FOR CANCER OF THE RECTUM

In cancer of the rectum sphincter-saving operations have been urged by some surgeons, but a majority of the most experienced continue to utilize the combined abdominoperineal resection of Miles as the operation of choice. It is no great surgical feat to anastomose two pieces of bowel low in the pelvis. If one insists on removing the bowel down to a point 3 or 4 cm. above the sphincter it may be a gymnastic accomplishment, but whether it is a monument to surgical judgment continues to remain debatable. All these operations can be performed with a low mortality at present, but the selection of a procedure which will insure the largest number of patients with five years' freedom from recurrence is the point of maximum interest.

I do not believe that one can perform a radical operation for cancer of the rectum low down without sacrifice of the levator ani muscles, and although it is obvious that there is a small percentage of recurrences in the area of downward drainage, Miles's observations and his work backed up by the work of David and Gilchrist,[1] Coller and others[2] still remains unshaken as far as growths in the ampulla of the rectum are concerned. It seems to me that the rectosigmoid juncture had best be the dividing line for anastomosis, and when any growth is situated at or above the peritoneal reflection a restoration of continuity of the gastrointestinal tract by suture may be considered. I have no knowledge of facts which at present controvert the assertion that taking the group of growths below the peritoneal fold and doing an anastomosis on them wherever possible will result in as large a number of survivals over a five year period as the radical operations which entail a colostomy and permit a more thorough dissection of the pelvis.

I believe the operations of choice for cancer of the rectum and lower sigmoid are: (1) combined abdominoperineal resection in one stage; (2) resection and anastomosis for those growths at or above the peritoneal fold; (3) colostomy and posterior resection (Mummery), and (4) local resection without colostomy (Harrison-Cripps and Quénu-Tuttle).

As for the pull-through operation and sphincter-saving operation for growths in the rectal ampulla, it seems that the burden of proof certainly is on the shoulders of their modern advocates. The men who originated these operations saw them abandoned long ago.

OPERABILITY AND RESECTABILITY

With the improvement of all phases of attack on cancer of the colon and rectum, the number of growths removable has increased considerably, and it is a rare series now which is reported with a resectability rate of less than 75 per cent. Resectability does not necessarily mean curability, but frequently resection is justified in the face of hepatic metastases when the local growth is extirpatable without too much increase in the operative risk. I am confident that all surgeons recog-

1. David, V. C., and Gilchrist, R. K.: A Consideration of Pathological Factors Influencing Five Year Survival in Radical Resection of the Large Bowel and Rectum for Carcinoma, Ann. Surg. **120**:421-438 (Oct.) 1947.

2. (a) Coller, F. A., and Buxton, R. W.: Small Bowel Obstruction, J. A. M. A. **139**:135-138 (May 14) 1949. (b) Coller, F. A., and Ransom, H. K.: The One-Stage Procedure for the Treatment of Carcinoma of the Rectum, Ann. Surg. **104**:636-650 (Oct.) 1936.

nize the desirability of extending a comfortable existence to a patient even though the ultimate outcome will definitely be fatal.

Coller in discussion of his article on small bowel obstruction [2b] pointed this out dramatically in an analysis of over 400 patients treated in his hospital for cancer of the colon. It was found that of all the patients, 40 per cent were beyond hope of surgical cure when they underwent operation. However, that did not preclude resection in certain cases in which palliation would be possible. He also pointed out that the mortality rate of the patients in whom the surgeon had a chance for cure, that is, in whom the lesion was localized to the intestine or the adjacent lymph nodes, was only a little over 1 per cent.

Operability or rather resectability is influenced by (1) distant metastases, (2) fixation of the growth and (3) complications in or associated with other abdominal viscera.

Given a case of cancer of the sigmoid which has metastasized to the liver but which is resectable, and in which an anastomosis may be done or an obstructive resection employed without too obvious an increase in mortality rate, I believe that most surgeons would accept the risk gladly. Mortality rates have reduced until they are almost to a minimal point. With better preparatory measures and control of infection by chemotherapeutic and antibiotic agents, one seldom need encounter a mortality rate of 5 per cent.

Two years ago, before the Section on Surgery of the American Medical Association in Atlantic City, N. J., I reported a series of combined abdominoperineal resections of the rectum with a mortality of 5.3 per cent.[3] Jones, discussing this paper,[3] reported a larger series of the same operation with a mortality rate of 3.2, and only recently he has reported a series of 137 consecutive combined abdominoperineal resections without a mortality.[4] These remarkable achievements, due to improvements in technic and better selection of cases for operation, are a point of pride to surgeons, but it would be well to remember that despite these apparent advances our efforts to get patients with cancer of the lower portion of the gastrointestinal tract to a surgeon at an earlier date have been more or less futile.

PROGNOSIS

With the improved technic and more satisfactory preoperative and postoperative phases of progress, the natural lowering in mortality and morbidity statistics has been accompanied with a more satisfactory prognosis. For a long time it has been recognized that cancer of the colon and rectum when extirpated early and radically offered a better prognosis than cancer elsewhere in the gastrointestinal tract.

In 1933 I reported [5] before the Section on Surgery of the American Medical Association a group of 453 cases of cancer, 187 of which were in the ascending colon and 266 in the descending colon. Of those with cancer of the ascending colon 57.6 per cent were alive and free from recurrence after five years, and of those with cancer of the descending colon 47.7 per cent were alive and well after five years. The average of the whole colon excluding the rectum was 51.3 per cent five year cures. Unquestionably another decade will see an improvement in these figures, provided always that the time required for recognition of the lesion is shortened.

As far as the rectum is concerned, it is difficult to improve on the five year cures reported by Abel [6] from the Cancer Hospital in London, his figures being 58.5 per cent for five year survivals following the Miles operation. My own figures showed a percentage of 52.4 for the same operation. A great many factors, such as the grade of the growth, affect the prognosis, which is more satisfactory for papilliferous, adenoid types of growth and most unsatisfactory for the melanotic types. Growths of the colloid type uniformly result fatally, although the patient may live a long term of years.

The size of the growth has little or nothing to do with prognosis or metastasis. Small growths of high grade frequently metastasize early, and large growths of low grade may remain localized for a long time.

271 West Short Street.

3. Rankin, F. W., and Johnston, C. C.: Surgical Treatment of Cancer of the Rectum and Rectosigmoid, J. A. M. A. **130**: 371-375 (Feb. 7) 1948.

4. Jones, T. E.; Robinson, J. R., and Meade, G. B.: One Hundred and Thirty-Seven Consecutive Combined Abdomino-Perineal Resections Without Mortality, Arch. Surg. **58**: 109-116 (Jan.) 1948.

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6. Abel, A. L.: Five Year Cures of Cancer of the Rectum by Radical Abdominal Excision, Surg., Gynec., & Obst. **60**: 481-482 (Feb.) 1935.

† Dr. Jones died on Sept. 29, 1949.

ABSTRACT OF DISCUSSION

Dr. T. E. Jones,† Cleveland: Since 1925 the tendency has been to do radical operations, and the best one, I think, is a combined abdominoperineal resection as outlined by Miles. That has given increasing curability. However, in the last few years the trend has changed again. Many persons object to colostomy, but with proper attention there is no valid objection to it. A disturbance will occur occasionally. It is up to the surgeon to encourage the patient about the management of his colostomy. With regard to diagnosis, I agree with Dr. Rankin that there is still nothing any better than the examining physician's finger and that one can diagnose 75 per cent of the lower gastrointestinal cancers without extensive roentgenologic work. It has become too easy to say "Go and have an x-ray made." The roentgenogram is expensive. By thorough manual examination one can save the patient's money. One should weigh cautiously what is read about the small operation for cancer. The family physician is interested in the patient's chances of cure. With regard to operability, the mortality rate has gone from 25 to 20, 15, 10, 5 and lower. What about the possibility of removing the growth? Data were collected on operations for a period of ten months; 105 patients were sent to the hospital as possible candidates for resection. Of that group, 88 underwent operation and the other 17 were inoperable; hence, the resectability rate in the group was 87 per cent. The scope of the operation is being extended all the time, and even if the patient cannot be cured the physician certainly has an obligation, if possible, to make him more comfortable. The curability rate has been taken from data on 102 patients with operations that were performed by associates and me in 1938. All the specimens were cleared; all the glands were dissected out, marked and examined individually. In the past six months we have reviewed these cases. We had a complete follow-up about six weeks ago of 96 of 102 patients, which is a high percentage after ten years, and since that time we have been able to follow another 5, so that we know exactly what happened to 101 of the 102 patients. All patients who are dead are supposed to be dead of cancer. Many were 60 or 70 years of age at operation and would now be 80, so they might have died of something else. To show the advantage of early diagnosis, which we are trying to emphasize, we divided this group into those with fewer than five glands involved and those with more than five involved. With fewer than five glands involved, 44 of 73 patients were alive at the end of five years. If a patient survives five years he has a great chance of living for ten years: at the end of ten years, 14 of 28 patients were alive, which is, again, 50 per cent. When five or more glands were involved (24 cases) the percentage of

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195

five year cures or five year immunity dropped from 60 per cent to 20 or 25 per cent. Also, at the end of ten years (this is a small group, only 9 cases), it fell to 10 per cent, although at the end of nine years there were still over 20 per cent alive as contrasted to 22 or 25 per cent at the end of five years. In the patients without venous involvement 46 of 85, or 55 per cent, were alive at the end of five years, and 14 of 31, again about 50 per cent, at the end of ten years. The veins were involved grossly and macroscopically in 10 instances. I am sure that if all specimens were examined carefully and stained for elastic tissue, venous involvement would probably be apparent in 20 or 25 per cent instead of about 10 per cent. At any rate, 3 of 10 patients were alive at the end of five years. The figure for five year survival was 60 per cent for those with cancer in the early stages, but it was only 33 per cent for those in whom the veins were involved. This is a plea for earlier diagnosis, because if one resects the lesion when it is limited to the mucosa, without infiltration of the mesenteric tract, then the veins will probably not become involved. For this entire group of 102 patients who were studied carefully and followed for a ten year period, we had a five year immunity rate of 52 per cent; eight years, 48 per cent; nine years, 49 per cent, and ten years, 43 per cent. If this is the best result with the most extensive operation that can be performed, how do surgeons hope ever to cure or have a survival rate equal to this with a lesser operation?

DR. R. K. GILCHRIST, Chicago: Of all the patients for whom the surgeon believes there is chance of cure, at least two thirds have involvement of the lymph nodes. One can predict exactly the spread of cancer through the lymph system. The lymph nodes act as filters to arrest the cancer emboli that land in these lymph channels and spread through them. If the surgeon does not remove these involved nodes, the patient will die of cancer later. When the tumor is partly or completely below the perineal resection, one cannot remove all the lymph drainage easily without removing the anus or destroying its ability to function. When I encounter enlarged nodes at operation, and they are metastasizing, I take the inferior mesenteric artery right off the aorta and clean the whole thing down and bring it out the transverse splenic junction as an internal colostomy. It is unlikely that a surgeon will ever be able to perform a radical resection of the lymph drainage if the lesion is even partly below the perineal reflex unless he removes the anus. He must remove the inguinal nodes if the lesion involves the skin. He must remove as widely as he can along the levators in order to get these nodes; and, upward, he must at least go 1½ inches (3.8 cm.) above the promontory; if there are many enlarged nodes, he had better take the inferior mesenteric right off the aorta. If the lesion is within the peritoneal cavity and he is able to reestablish continuity, he must not do so if there are many enlarged nodes, because retrograde metastasis does occur in such cases, and occurs at 2 and 3 inches (5 and 8 cm.). If he does try to reestablish them he will do so only after he has removed this much mesentery and this much lymph drainage and at least 1½ inches (3.8 cm.) or preferably 2 inches (5 cm.) of bowel, plus the mesentery below the lesion. If he does that and has circulation left with which to reestablish continuity, that is commendable. If not, he is not giving the patient a proper chance and has no business calling the operation a radical one.

DR. FRED W. RANKIN, Lexington, Ky.: Dr. Jones, Dr. Gilchrist and I agree that the radical operation, accompanied with a colostomy, is the best opportunity for cure of persons with cancer of the rectum. The spread by venous channels is something to which we have not paid as much attention as we should, but if there is anything that has been admitted by surgeons for cancer elsewhere in the body, it is that one must not operate for the local lesion, that one must take away the gland-bearing tissues in juxtaposition to the cancer and remove the second group of glands if one hopes to obtain a satisfactory end result. That is such an established principle, it seems extraordinary that so many persons would overlook it in dealing with cancer of the gastrointestinal tract and insist on a local operation merely to save the sphincter mechanism. I do not believe that anyone can perform a radical resection of a cancer of the rectum and leave the levator ani in. If one is going to cure the patients, one must resort to widespread procedures which remove the glands. The spread mostly, as Dr. Gilchrist has shown, is in the upper direction to the superior mesenteric and hemorrhoidal vessels and laterally to the inferior rectal fossa and the fat there, and the levator ani. The fact that someone has rediscovered that Miles only claimed about 2 or 3 per cent of recurrences in the downward zone of spread has been given as a reason for doing these local excisions of cancer, with preservation of the sphincter. I think this sentimentality about saving the sphincter is ridiculous. Everyone who has performed a large number of these operations has seen as the result happy, perfectly well persons carrying on their functions with little or no disability. There are too many physicians—not surgeons, but too many internists—who see the patients early but who insist that a colostomy is a horrible thing. It is not horrible if it is needed, and the patient ought to have it where he can control it.

EVALUATION OF PRESENT DAY TRENDS IN OBSTETRICS

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During recent years certain accepted principles for the care of the maternity patient and her infant have been challenged. Ideas have been expressed questioning the reality of labor pain or the need for analgesic and anesthetic drugs during labor. It has been claimed that labor pain is psychologically necessary for the mother. Furthermore, certain psychologic dangers to the newborn child have been suggested as arising from routine hospital nursery care and infant feeding.

These claims challenge principles and procedures that have been taught as sound modern obstetrics.[1] During the past two decades, with these principles in use, the maternal mortality rate in this country has become one fifth of that observed at the beginning of this period.[2] This gratifying reduction in the national maternal mortality rate reflects a general reduction in the three major causes of maternal deaths, puerperal septicemia, toxemia and hemorrhage.[3]

The recently advocated methods concern the conduct of pregnancy and labor and the care of the newborn child. These claims imply that there is possible psychologic harm to mother and child arising from the standard procedures and practices used in the course of pregnancy, labor, delivery and early infancy. Advocates of these claims have in common the belief that perhaps more "natural" ways of childbirth might be desirable.[4] It is important, therefore, to reexamine

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Read before the Section on Obstetrics and Gynecology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

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some of the beliefs in modern scientific obstetrics. It is also important to examine critically not only the facts, the logic and the claims of those raising these questions but the clinical value of the new methods as well, with the fact in mind that these methods are advocated during a period of obstetric progress reflected by a decided reduction of maternal and fetal mortality and morbidity. This is not to imply that present obstetric methods are entirely correct, or, in some instances, even adequate. However, the important question which must be answered here is whether these recently advocated methods result in better or worse obstetric care. Furthermore, we do not intend to circumscribe the definition of obstetric care but rather to include in the meaning of the term consideration not only of the life and the health but of the emotional welfare and the happiness of both mother and child. Sound obstetric care must concern itself with psychologic factors.

It should be noted that these new methods, which have been propounded in popular magazines [5] as well as in medical literature,[6] represent to a large extent the return to earlier concepts and practices. This reintroduction of older obstetric methods must not only interest those who are engaged in the care of the maternity patient and her child but also demand the attention of those interested in, or responsible for, construction, maintenance and administration of maternity units.

The central purpose of this paper is to analyze critically the methods suggested and to determine whether or not they have any scientific or practical virtues as related to present obstetric management and hospital procedure.

The claims for these methods pose at least seven questions. These questions are: 1. What scientific grounds are there for current statements to the effect that childbirth among primitive or noncivilized women is easy, not uncomfortable or complicated, and that recovery is rapid when compared with that of civilized women receiving modern obstetric care? 2. Are labor contractions actually painful? 3. What are some of the implications of the term prenatal influences? 4. Is pain during childbirth psychologically necessary for the mother? 5. Does the infant suffer psychologic damage from routine hospital nursery care? 6. Are special methods of infant feedings necessary for the ultimate happiness and psychologic health of the newborn child? 7. Should the present methods of the conduct of labor be replaced by the "natural" way?

OBSTETRICS IN PRIMITIVE PEOPLES

There exists currently a widespread obstetric belief that modern civilized women have great difficulties during labor in comparison with women who have lived or do live in less industrialized societies. Statements are made such as, "considering first the physical aspect of confinement and delivery among primitive peoples, we find a weight of evidence from many parts of the world to the effect that childbirth is easy and that the woman returns to her labor within a short time." [7] In a publication devoted to the psychology of women one finds, "At any rate it is generally considered an established fact that the reproductive process in primitive women is simpler than that in women 'degenerated by civilization,'" [8] or, from another publication, "Civilization and culture have brought influences to bear upon the minds of women which have introduced justifiable fear and anxieties concerning labor. The more cultured the races of the earth have become, so much the more dogmatic have they been in pronouncing childbirth to be a painful and dangerous ordeal." [9] Other writers, speaking of Eskimo women, said "They suffer little; they appear to be exempted from the curse of Eve and deliver their children with as little concern as is exhibited among the brutes," [7] or, "Among primitive people, still natural in their habits and living under conditions which favor a healthy development of their physical organization, labor may be characterized as short, and easy, accompanied by a few aches and followed by little prostration." [8] Statements of this type appear in great number.

However, if one examines the original sources on which such remarkable statements are based, it is clearly apparent that no data are recorded, and hence there is no scientific or factual foundation for these statements. In order to know the facts about childbirth in the less industrialized ethnic groups, such as those of Indians, Africans and South Pacific Islanders, among others, actual observations are necessary. The studies should include: (1) carefully recorded data of observations on a significant number of women in labor made by some one competent to assess obstetric problems; (2) careful study of pain in these groups of women during the course of labor; (3) data describing the fetal and maternal mortality rates in these patients, and (4) follow-up studies giving data on the morbidity rate and the eventual medical, psychologic and social health, as well as the life expectancy, of both mother and child.

This would constitute a reasonable study and might well include some additional studies of a cross section of American women as well.

However, such reports as are available contain scarcely any observations pertaining to the birth process, and these observations are made up in a way which, unfortunately, has characterized so much of the anthropologic literature on this aspect of human reproduction, that is, by hearsay, anecdotes and, in some cases, possibly by bias and prejudice.[9] We arrived at this rather forceful conclusion after reviewing the major works on the subject, papers by anthropologists,[10] and, in addition, after examining the Cross

5. Babies Are Welcome Here, Woman's Home Companion, January 1949, p. 116. Let's Feel Less Pain, Time Magazine, Jan. 31, 1949, p. 54.

6. Read.[46] Goodrich and Thoms.[46]

7. Sumner, W. G., and Keller, A. G.: The Science of Society, New Haven, Yale University Press, 1927, vol. 3.

8. Englemann, G. J.: Labor Among Primitive Peoples, ed. 2, St. Louis, J. H. Chambers & Company, 1883.

9. Ploss, H. H., and Bartels, M.: Women: An Historical Gynaecological and Anthropological Compendium, London, William Heinemann, Ltd., 1935, vol. 2. Harley, G.: Comparison Between the Recuperative Bodily Power in Man in a Rude and in a Highly Civilized State: Illustrative of the Probable Recuperative Capacity of Men of the Stone Age in Europe, J. Anthropolog. Inst. Great Britain & Ireland 17:168, 1887. Best, E.: The Lore of the Whare-Kahu (Fœtus Home) and the Whare Koanga (Nest House), J. Polynesian Soc. 15-16:17, 1906-1907. Matthews, M. D.: On the Manners, Customs, Religion, Superstitions, Etc. of the Australian Native, J. Anthropolog. Inst. Great Britain & Ireland 24:186, 1895. Sumner and Keller,[7] Englemann.[8]

10. Barton, R. F.: Philippine Pagans: The Autobiographies of Three Ifugaos, London, George Routledge & Sons, Ltd., 1938. Best, E.: Ceremonial Performances Pertaining to Birth as Performed by the Maori of New Zealand in Past Times, J. Anthropolog. Inst. Great Britain & Ireland 44:135, 1914; The Maori as He Was: A Brief Account of Maori Life As It Was in Pre-European Days, New Zealand Board of Science and Art, Manual no. 4, Dominion Museum, Wellington, New Zealand, 1924. Donaldson, T.: The George Catlin Indian Gallery in the United States National Museum (Smithsonian Institution) with Memoirs and Statistics: Annual Reports of the Board of Regents of the Smithsonian Institution to July 1885, Washington Government Printing Office, 1886, pt. 5, pp. 530-531. Evans-Pritchard, E. E.: Heredity and Gestation as the Zande See Them, Sociologus 8:1-4, 1932. Gilmore, M. R.: Notes on Gynecology and Obstetrics of the Arikara Tribe of Indians, Michigan Acad. Sc. & Arts & Letters 14:71, 1930. Hildebrandt, J. M.: Ethnographische Notizen ueber Wakamba und ihre Nachbarn, Ztschr. f. Ethnologie 10:347, 1878. Hooker, J.: Childbearing in Australia and New Zealand, J. Ethnolog. Soc., London 00:170, 1868-1869. House, S. R.: Notes on Obstetric Practice in Siam, Arch. Med. 1:309, 1879. Jenness, D.: The Life of the Copper Eskimo: Report of the Canadian Arctic Expedition 1913-1918, vol. 12: Southern Party, 1913-1916; Ottawa, 1922. Jupod,

(Footnote 10 continued in next column)

Cultural Survey at the Institute of Human Relations at Yale University. (Dr. Seymour Romney aided in searching the literature.)

Only one study could be found with recorded observations of a series of women in labor, that of Hrdlička,[11] a physician, who reported on the labor and delivery of 67 Pima and Apache women. From his reports the incidence of prolonged labor was 21.7 per cent. Labor of twenty or more hours from onset to completion of the birth process is defined as prolonged labor. This frequency is significantly higher (significance ratio 4.7) than the 1.8 per cent which was the incidence of this syndrome in an attended group of patients at the Boston Lying-in Hospital.[12] The only other quantitative data are about recovery from parturition and the fact that the Navajo mothers (15 cases) do not return to their household duties for about a week after an uncomplicated delivery.[13] Hrdlička concluded, ". . . the healthy Indian women suffers . . . quite as much and as long as does the normal white woman. . . ." (table 1).

TABLE 1.—*Comparison of the Incidence of Prolonged Labor in Pima and Apache Women and Women in a Modern Obstetric Hospital*

Year	Subject	No. of Cases	Prolonged Labor 20+ Hours
1908	Pimas and Apaches	67	21.7%
1940 to 1944	Boston Lying-In Hosp'tal	11,567	1.8%
Significance ratio = $\frac{19.9}{\sqrt{22.5}}$ = 4.7		Odds = 25,000+ : 1	

It is interesting to turn from the consideration of so-called primitive peoples to the consideration of groups of modern Americans who are less favored economically than others, specifically Negroes and Navajo Indians. The mortality rates of white and Negro mothers in the United States offer an opportunity to compare two groups, the white mother, with more scientific obstetric care, and the Negro mother, probably with more natural childbirth. Although there are many contributing factors, the fact that the maternal mortality in the Negro group[1] is almost three times as high as that in the white group[2] does not make one immediately enthusiastic about returning to more natural childbirth (fig. 1). Also, an estimated maternal mortality rate of 10 deaths per 1,000 live births has been reported recently for the Navajo Indians, an ethnic group often used for comparative purposes.[14] These observations do not support the principle that primitive surroundings and more natural childbirth are conducive to better maternal welfare. It would seem instead to support the belief that there is a great need for a further expansion of modern obstetric hospital facilities and trained personnel.

In summary, it can be said that there are no reliable data to support the opinion that the "primitive peoples," whom we prefer to call peoples of less industrialized societies, have babies without pain and without difficulty. There are no data which suggest that pain during labor is an artificial product of culture and civilization or that primitive obstetrics is so satisfactory that it should be adopted by the modern American hospital.

PAIN IN LABOR CONTRACTIONS

In a publication which devoted considerable space to the consideration of pain in labor, the point of view is expressed, ". . . nature did not intend labor to be painful."[4b] How nature's intention was revealed is not stated. The opinion is expressed that the simple sensations of uterine contractions are misinterpreted by the thalamus as pain.[4b] Apparently this writer believes that the patient eventually experiences something which feels like pain but "the cause of the uterine pain in uncomplicated labor is, therefore, due to the condition of the interpretation of sensations to which a woman is subjected." No data are offered to support the opinions and assumptions expressed by the author, and no data are offered to support the conclusions.

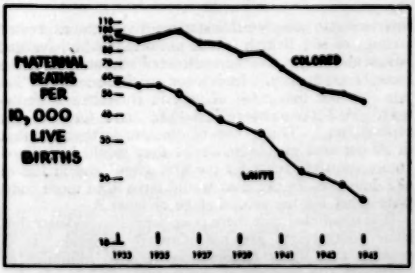

Fig. 1.—Chart showing the incidence of maternal mortality in white women as compared to Negro women. (Rates are charted on a logarithmic scale. After Potter and Adair, data from the National Office of Vital Statistics.)

The problem of estimating the presence and amount of pain accurately and quantitatively is a difficult one. Awareness of pain and the amount of pain are both subjective experiences. Little is known about pain and its quantitative aspects at best. There is perhaps to date no more reliable method, if a standardized technic of questioning and recording answers is used, of estimating whether or not a patient experiences pain than a statement from the patient that something is painful or is not painful. A recent study by Hardy and Javert attempted to estimate the amount of pain experi-

H. A.: The Life of a South African Tribe: Social Life, London, Macmillan & Company, Ltd., 1927, vol. 1. MacCauley, D.: Seminole Indians of Florida, Fifth Annual Report of the Bureau of Ethnology to the Smithsonian Institution, Government Printing Office, Washington, 1887, vol. 5, p. 497. Malinowski, B.: The Sexual Life of Savages in North-Western Melanesia: An Ethnological Account of Courtship, Marriage and Family Life Among the Natives of Trobriand Islands, British New Guinea; London, George Routledge Sons, Ltd., 1929. Man, E. H.: On the Aboriginal Inhabitants of the Andaman Islands, J. Anthropolog. Inst. Great Britain & Ireland **12**:87, 1882-1883; The Nicobar Islanders, J. Anthropolog. Inst. Great Britain & Ireland **18**:378, 1888-1889. Mead, M.: Sex and Temperament in Three Primitive Societies, New York, William Morrow & Company, 1935. Michelson, T.: The Autobiography of a Fox Woman: Fortieth Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution 1918-1919, Washington, Government Printing Office, 1925, pp. 291-349. Powdermaker, H.: Vital Statistics of New Ireland (Bismarck Archipelago) As Revealed in Genealogics, Human Biol. **3**:351, 1931; Life in Lesu: The Study of a Melanesian Society in New Ireland, New York, W. W. Norton & Co., Inc., 1933. Shattuck, G. C.: The Peninsula of Yucatan Medical, Biological, Meteorological and Sociological Studies, Washington, Carnegie Institute of Washington, 1933, p. 66. Starcke, C. N.: The Primitive Family in Its Origin and Development, New York, D. Appleton & Company, 1889, p. 52. Stevenson, M. C.: "The Sia," in Powell, J. R.: Eleventh Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution, Washington, Government Printing Office, 1894, pp. 136 and 143. Swanton, J. R.: Religious Beliefs and Medical Practices of the Creek Indians, Forty-Second Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution, Washington, United States Government Printing Office, 1925, pp. 473-672. deVidas, J.: Childbirth Among the Aranda, Central Australia, Oceania **3**:117, 1947. Wales, H. Q. Q.: Siamese Theory and Ritual Connected with Pregnancy, Birth and Infancy, J. Anthropolog. Inst. Great Britain & Ireland **63**:441, 1933. Sumner and Keller,[3] Engelmann,[4] Pima and Bartels; Harley; Best, and Matthews.[5]

11. Hrdlička, A.: Physiological and Medical Observations Among Indians of Southwestern United States and Northern Mexico, Bureau Am. Ethnolog. **34**:1-406, 1908.

12. Reid, D. E.: The Treatment of Prolonged Labor with Pituitary Extract, Am. J. Obst. & Gynec. **52**:1, 1946.

13. Kluckhohn, C.: Some Aspects of Navaho Infancy and Early Childhood, Psychoanal. & Social Sc. **1**:37, 1947.

14. Leighton, D., and Kluckhohn, C.: Children of the People, London, Cambridge University Press, 1948.

enced during labor by use of the Thermal Radiation apparatus.[15] The intensity of pain in labor was compared by the patient to the intensity of pain she experienced from a graded stimulus from this apparatus. The patient's awareness of the intensity of pain during labor was compared to the patient's awareness of intensity of pain in response to a known, quantitatively graded, painful stimulus. According to these observers, who made 55 measurements of pain intensity on 13 unmedicated patients during first, second and third stages of labor, pain began from threshold value to 2 dols (dol is a term used to denote a unit of pain and has a value of approximately one-tenth the intensity of maximal pain) in intensity and increased in intensity as labor progressed. During the second stage, pain intensity was reported as 10 to 10½ dols, the latter being ceiling pain, the most intense pain which can be experienced. The authors further observed that the intensity of pain in the first stage of labor was roughly proportional to the extent of cervical dilatation and inversely proportional to the duration of the interval between uterine contractions.

In "Childbirth Without Fear,"[4b] the statement appears, ". . . there is apparent evidence (the apparent evidence is not presented) that parturient women from whom education and treatment have eliminated fear so far as it is possible have no desire for reagents exhibited for the sole purpose of relieving physical pain." It is interesting to compare this statement with the expressed feelings of 196 British female physicians who have had babies and might also be considered educated as to the facts of pregnancy. In answer to the question, "Do you consider that relief of pain in childbirth is necessary," 90.8 per cent replied "yes" and 4.1 per cent replied "no." This group of mothers further felt that in 29 per cent of 425 deliveries they would have liked "more complete relief for the first stage" and in 103 of 425 deliveries 24 per cent would have liked more complete relief for the second stage of labor.[16]

TABLE 2.—*Relation of the "Paranatal Physical Condition" to the Personal Adjustment in Childhood in 226 Children Between the Ages of 5 and 8 Years* *

Paranatal Physical Condition	Poorly Adjusted
Good (167 cases)	19.2%
Poor (59 cases)	39.0%

* Stevenson.[21]

It is concluded that there is no scientific evidence that labor contractions are not naturally painful. It is possible that many factors may tend to minimize or aggravate the amount of discomfort and pain that a patient experiences, but these factors have not as yet been evaluated scientifically by anyone.

IMPLICATIONS OF THE TERM PRENATAL INFLUENCE

During the last century much concern was felt by both patients and physicians that unusual experiences of the mother might affect the fetus. As an example of this belief the *American Journal of Obstetrics and Diseases of Women and Children* of 1848 reported a case of a mother who, during the course of pregnancy, came into contact with a sunfish—the infant was disfigured by a birthmark which resembled a sunfish.[17] Many similar instances are in the literature.[18] One finds today a recurrence of beliefs regarding the influence on the fetus of the emotional attitudes of the mother. A recent article states, "The physiology of the mother is changed when she is under emotional strain, and the effect of these changes is transmitted to the fetus through the placental circulation and in other ways."[4d]

This type of speculation is in sharp contrast to the recent scientific observations of prenatal influences affecting the newborn infant. These observations include studies of the fetus as related to human genetics,[19] the Rh factor in erythroblastosis,[2] the relation of infectious diseases, such as syphilis, to the condition of the child [2] and the production of malformations, including microcephaly and mental retardation, in the infant because of maternal German measles.[20] Recently information correlating the adjustment of the child in relation to its "paranatal physical condition" has become available [21] (table 2).

It can be concluded that these studies are good evidence that some prenatal influences do exist and that further scientific studies might yield valid knowledge of the mother-child interrelationship, even emotional influences, but anecdotes and uncontrolled statements are of little value.

PSYCHOLOGIC NECESSITY FOR PAIN IN CHILDBIRTH

It has been said that labor pain is a psychologic necessity for women. This is exemplified by the statement, " . . . and some degree of that gratification of that primary feminine quality that assigns pain a place as a pleasure experience in the psychologic economy, are precious components of motherhood, and an effort should be made to preserve them."[4f] It would appear that there is being conveyed the notion that it is necessary for women to suffer and that, if they miss the suffering that accompanies labor, there will be highly unfortunate results from this psychologic deprivation. However, there is no reliable evidence that women need experience pain in labor in order to remain normal and healthy. There are no follow-up studies of any kind to suggest that women who have not experienced pain during labor have developed any psychiatric symptoms or diseases or that they appear to have been harmed by escaping painful childbirth. It is implied that it is the pain of labor that is necessary for the mother and not simply the awareness of having had the baby. In deliveries made with caudal anesthesia, when the patient was aware of the proceeding but felt no pain, it is stated that the mother felt that the experience of delivery was "disappointing and empty."[4f] It is insinuated that in some way this is harmful to mother and child. It is obvious that there are two attitudes regarding the pain of labor. One is based on the idea that pain does not naturally exist in labor; the other contends that pain does exist and that it is psychologically important for the patient to experience this pain.

It has been further stated, "There is an increasing number of women who, without being actually neurotic, nevertheless behave in an unusual fashion after a

15. Hardy, J. D., and Javert, C. T.: Studies in Pain; Measurements of Pain Intensity in Childbirth, J. Clin. Investigation **28**: 153, 1949.
16. Pain in Childbirth, report of Subcommittee of the Medical Women's Federation, Brit. Med. J. **1**: 333, 1949.
17. Gardener, C. F.: Maternal Impressions, Am. J. Obst. & Dis. of Women & Child. **37**: 211, 1898.
18. Ellis, H.: Studies in Psychology of Sex, New York, Random House, 1936, vol. 3.
19. Hogben, L.: Nature and Nurture, London, George Allen & Unwin, Ltd., 1939, p. 143. Snyder, L. H.: Medical Genetics, Duke University Press, 1941, p. 130.
20. Wesselhoeft, C.: Rubella and Congenital Deformities, New England J. Med. **240**: 258, 1949. Wesselhoeft, C.: Rubella, New England J. Med. **236**: 943, 1947.
21. Stevenson, S. S.: Paranatal Factors Affecting Adjustment in Childhood, Pediatrics **3**: 134, 1948.

technically perfect, painless delivery. Something has happened during childbirth to disappoint such women and fill them with horror, and this now prevents them from developing love for the newborn. The child remains associated with the horror, a rejected alien object."[4f] No data are given to support the claim that there are an increasing number of women who behave in this unusual fashion. No facts are presented about this lack of "love for the newborn," and nothing is really told about what actually may have happened to the "rejected alien object." On the whole, this could be classified as a fairly irresponsible statement which might be a source of worry to a mother who takes this type of "psychology" seriously.

There is one disease in pregnancy, puerperal psychosis, in which the mother characteristically feels that the baby is not her own, that it is not all right or that it is not as she expected. It should be noted that since the introduction of analgesia at the Boston Lying-in Hospital (1931) there has been no increase in this illness (table 3). The prevalence of anxiety neurosis and hysteria in patients of the Boston Lying-in Hospital, where analgesia and anesthesia are used extensively in labor, was no different than that of the general population. In 100 women interviewed there during the puerperium there were no cases of hysteria and 5 cases of anxiety neurosis (criteria for these disorders described elsewhere [22] were used). The prevalence of anxiety neurosis in the community is 5.6 per cent, according to one study.[23]

A recent report of a study made in this country states that, of 156 women who were delivered, 80.7 per cent received little or no medication and 19.3 per cent received either more prolonged anesthesia or the usual amount of analgesia or anesthesia.[4e] However, one half of the patients received some analgesic drugs or some anesthetic gas in analgesic amounts. It was further stated that when the patient required drugs to relieve the pain that was being experienced, the authors believed that the predominant factor was usually "deep-seated anxiety noted after the labor started." It is not clear how this deep-seated anxiety was defined or detected or how it was learned that anxiety rather than some other factor (possibly the presence of pain) caused the request for analgesic drugs.

These women were asked by questionnaire whether they wanted to have their next babies the same way. Of 148 patients, 125, or 84.5 per cent, said "yes." As part of a study being conducted at the Boston Lying-in Hospital, where analgesia is used in labor, the same question was asked. In reply, 72 per cent of 86 women wanted to have the next baby the same way; 84.9 per cent wanted it the same way or with more analgesia and/or less awareness of delivery, and 3.5 per cent wished to have no analgesia or more awareness of delivery.[24] These proportions of 84.5 and 84.9 per cent are not statistically different.

The conflicting data of these two questionnaires emphasize the inaccuracies of poll opinions, which have been increasingly obvious.[25] The selection of patients, the exposure of patients to certain types of hospital practices and teaching and the phrasing of the questions all might influence the validity of the answers.

Although the claim is made that pain during labor is good for women, there are no data to support this viewpoint. Further, there are no psychologic data to support the claim that natural childbirth is "psychologically desirable" for most women.[4e]

PSYCHOLOGIC DAMAGE TO THE INFANT

In providing for the care of the newborn infant in American obstetric units, technics have been developed, one purpose of which is the prevention of infection. These methods involve the partial isolation of infant and mother and the relatively complete isolation of one infant from another. The babies are housed in nurseries which are intended to provide the maximum baby care with the minimum of hospital personnel. With this system the mother feeds the child, but the remainder of the care of the infant is the responsibility of the nurse in charge of the nursery. It has been stated that this procedure provides a source of remote psychic danger to the infant. It has been implied that there is an increased amount of neurosis in this era of civilization [26] which is in some way related to the technics described, that is, to the period of separation of the infant from its mother during the first few days of its life.

TABLE 3.—*Incidence of Psychiatric Diseases in the Puerperium of Women at the Boston Lying-in Hospital* *

	Size of Sample	Rate: Cases per 1,000
Anxiety neurosis	100	0.050
Hysteria	100	0.000
Puerperal psychosis	2,595	0.002

* There was no evidence of excessive psychiatric disease associated with the use of analgesia.

Similar, and supposedly relevant, problems in the life of the dinosaur are raised thus: "The female (dinosaur) laid the eggs in the sand and left the infants in the hands of fate. . . . there are some modern parents who seem to think this was a good idea. . . . they seem even to prefer to be dinosaurs.

"Scientists . . . are apt to speculate on what went wrong with the system. After careful study, we can safely assume that one cause of their extinction was lack of relationship with their young." The details of this "careful study" were not presented.[27]

It has been stated, "Some physicians who have had the opportunity to study feeding behavior and disorders in young children, together with the neuropsychiatric disturbances of adults, have expressed the opinion that the separate care of maternity and newborn patients in the hospital and the extension of the hospital's rigid schedule into the home has offered a favorable medium for the growth of unnecessary conflict between mother and child." [28] It has further been stated that mothers and babies are happier when they can be together from the moment of birth and that the mother "will have no fears when she goes home because she is already

22. Wheeler, E. O.; White, P. D.; Reed, E. W., and Cohen, M. E.: Neurocirculatory Asthenia (Anxiety Neurosis, Effort Syndrome, Neurasthenia): A Twenty Year Follow-Up Study of One Hundred and Seventy-Three Patients, J. A. M. A., to be published. Purtell, J. J.; Robins, E., and Cohen, M. E.: Observations on the Clinical Aspects of Hysteria; Unpublished data.

23. Wheeler, E. O.; White, P. D.; Reed, E. W., and Cohen, M. E.: Familial Incidence of Neurocirculatory Asthenia (Anxiety Neurosis, Effort Syndrome), J. Clin. Investigation **27**: 562, 1948.

24. Cohen, M. E.; Stern, R., and Reid, D. E.: Unpublished data.

25. Report on the Analysis of Pre-Election Polls and Forecasts, Pub. Opinion Inst. **12**: 598, 1948.

26. Jackson, E. B.: Rooming-In Gives Baby a Good Start, The Child, April 1948, Federal Security Agency, Children's Bureau.

27. Ribble, M.: The Rights of Infants, New York, Columbia University Press, 1943.

28. Jackson, E. B.: General Reactions of Mothers and Nurses to Rooming-In, Am. J. Pub. Health **38**: 689, 1938.

well acquainted with her baby."[29] However, no data have been offered in support of such assertions. They remain purely speculative and might be frightening threats to the magazine-reading mother.

From the standpoint of personal choice, preference and pleasure, there seems to be no reason why, within the limit of a definite hospital's facilities, a mother should not have the right to take care of her baby or play with her baby when and if she pleases. She should not be made to feel, however, that she is shirking her duty if she prefers to have the nurse take the care and responsibility of the baby and wishes to have a rest from home, work and routine, nor should she be threatened with unfounded rumors as to the future unhappy lot of the baby whose mother abandons it to the care of the nurse and nursery. Thus far there is evidence that having the baby at the mother's bedside is a safe hospital procedure.[30] It has been suggested that there may be certain pediatric advantages in this type of arrangement.[30] Successful breast feeding and a better acquaintance with the methods of early infant care were believed to be promoted by this arrangement. However, there may be certain disadvantages.

It is not known whether there is more or less demand for nursing care and supervision when the baby is constantly at the mother's bedside, in contrast to the usual nursery plan. When a free choice is given the mother, the demand for this type of service may not be great. During the past two years "rooming-in," a term used to describe the baby's residence at the mother's bedside, has been optional in the private pavilion of the Boston Lying-in Hospital. The prospective mothers have had opportunities to know that this service was available through publications and from the physicians on the staff. Granting that different members of the staff had varying degrees of enthusiasm for this method, the fact that only 60 mothers in approximately 6,000 deliveries, an incidence of 1 per cent, chose to have the baby living with them throughout their hospital stay would indicate that there is not a great spontaneous demand for this type of service in this institution. It appears that certain patients do desire to have their babies with them throughout their hospital stay, and some who have participated in this plan find it pleasant and are enthusiastic about it.[30] This is, however, different from statements that harm accrues to children who do not spend the first week of their lives in this manner and that this method "can offer protection against some of the severe emotional difficulties of children which the routinized child care regimens of yesteryear have encouraged."[31]

SPECIAL METHODS OF INFANT FEEDINGS

Patients on occasion ask the obstetrician whether, from the standpoint of psychologic considerations, the baby should have breast feeding or bottle feeding. The Chairman of the Committee on Maternal and Child Feeding of the National Research Council concluded a recent investigation of this problem by stating, "Although there is a voluminous literature on the subject of the emotional value of breast feeding to both mother and baby, it is regrettable that concrete evidence on this point is difficult to obtain. This is particularly regrettable in the rather emotional treatment the subject is receiving in both medical and lay circles. The necessary evidence will have to come from long observations on the development of the personalities of both breast-fed and artifically fed infants."[32] A review of the emotional aspects of this subject was recently made by Orlansky,[33] who concluded that there is no evidence today which shows that bottle feeding is preferable to breast feeding, that breast feeding is preferable to bottle feeding or that the manner in which each are performed has any effect on the psychologic development of the child.

There has been some concern over the merits of scheduled feedings versus nonscheduled feedings for infants. Nonscheduled feeding is advocated with almost the same positiveness with which it was formerly claimed that a child must be fed regularly by the clock in order that it would not develop "bad habits." It is now maintained that regular feeding is psychologically bad and that the child should be fed on a "self-demand" schedule. The exact definition of the self-demand feeding is not clear, but the purpose of it is to feed the child when it is hungry rather than at scheduled times. Since the infant cannot say when it is hungry, in practical terms this amounts to the mother offering to feed the child when it cries without an explanation, when it continues to cry even with an obvious explanation, when it seems to be hungry and also when it seems to be meal time for the child. It is implied that the child who is not fed when it cries may later develop into an "anxious" person. The type of evidence in support of this point of view, that is, unsupported speculation, is contained in quotations such as these: "To the white child whose feeding and other routines are rigidly scheduled, the mother or nurse . . . must appear incalculable. It seems plausible that many children develop an unconscious conviction that each individual is alone in life. To the Navajo baby on the other hand, others must appear warmer and more dependable, for every time he cries something is done for him,"[13] and, "The parent who responds to a clock rather than to the behavior of the child is from the child's point of view not responsive at all. . . . If the rewards which a child receives bears no consistent relation to his behavior . . . an apathetic or an anxious or hostile individual is likely to result."[13]

It does not seem proper for physicians to advise mothers on the method of infant feeding purely on the basis of such unfounded speculation. Social scientists today offer advice to physicians on the basis of what has been observed about one feature of life in one group, such as the Okinawans,[34] the Japanese[35] and the Navajoes,[13] with no evidence that these observations are really applicable to medicine or to the American life, although plausible remarks or intriguing analogies may be contained in their statements.

Until a study is actually done in which infants, in sufficient numbers of comparable groups, are fed on scheduled feedings and self-demand feedings, with

29. Jackson, E. B.: Mother and Babies Together, The Parents Magazine, October 1947, pp. 18-19.

30. Montgomery, T. L.; Steward, R. E., and Shenk, E.: Observations on the Rooming-In Program of Baby with Mother in Ward and Private Service, Am. J. Obst. & Gynec. 57:176, 1949.

31. Jackson, E. B.; Olmstead, R. W.; Foord, A.; Thoma, H., and Hyder, K.: A Hospital Rooming-In Unit for Four Newborn Infants and Their Mothers, Pediatrics 1:28, 1948.

32. Aldrich, C. A.: The Advisibility of Breast Feeding, J. A. M. A. 135:916 (Dec. 6) 1947.

33. Orlansky, H.: Infant Care and Personality, Psychol. Bull. 46:1, 1949.

34. Moloney, J. C.: The Cornelian Corner and Rationale Publications: Problems of Early Infancy, New York, Josiah Macy, Jr. Foundation, 1947.

35. Benedict, R.: The Chrysanthemum and the Sword Patterns of Japanese Culture, Boston, Houghton Mifflin Company, 1946.

adequate follow-up studies made into adult life, there is no reason to state that the psychologic future of the child is safe or is endangered by either type of feeding.

METHODS OF THE CONDUCT OF LABOR

A discussion of these methods of maternal and child care which have been recently advocated would not be complete without a comparison of the results between the methods used in most obstetric hospitals and those which have been recently suggested.[36] The conduct of labor in the "natural" way has been described as a procedure of noninterference when the presentation and position of the baby is normal at the onset of labor. Little or no analgesia or anesthesia is used with this method, but suggestive therapy is prominent.

Since the days of those pioneer physicians, James Y. Simpson and Walter Channing, humanitarian obstetricians and physicians have been interested in the development of analgesic drugs and anesthetic agents to relieve the pain associated with the birth processes. During recent years in this country Hingson and Hellman at the Johns Hopkins Hospital,[37] Lull and his associates at the Philadelphia Lying-in Hospital,[37] Irving,[38] and more recently Hershenson,[39] at the Boston Lying-in Hospital, as well as many other investigators, have added materially to the knowledge and technics of the control of pain during labor. Indications and contraindications have been established for the different methods and technics. It is evident that the ideal method which will insure complete relief from pain in all patients is not yet available. Figure 2 reveals the fetal and infant mortality (all stillbirths and neonatal deaths occurring in babies from the twenty-eighth week of gestation) at the Boston Lying-in Hospital for a period of time prior to and following the introduction of analgesic drugs to the present. The general improvement in obstetric care over the years is probably reflected in these results. It would be helpful to compare this fetal mortality, in cases in which analgesia and anesthesia have been used during labor and delivery, with that associated with natural childbirth, but at present this is impossible because the fetal results from the latter method have as yet to be completely reported.[6] In the absence of such data it is reasonable to conclude that the well controlled use of analgesic drugs and anesthetic agents to relieve pain during labor has not produced any increase in fetal and infant mortality. As a matter of fact there is a continuing decrease of this mortality. Furthermore, there have been studies which reveal that analgesia and anesthesia may be associated with the lowest fetal mortality rate.[37]

A recent article in the *British Medical Journal*[42] suggests that, in addition to the psychology and neurology, the obstetrics of "natural" childbirth should be carefully evaluated. The actual delivery with the method which the author prefers to call "natural" childbirth is described as follows:

> It is not a feeling of actual tension or tearing but of burning. If you ask them to describe the pain they will say "they are burning or stinging down below."
>
> That sensation has a neurological basis. It is very largely due to the fact that certain nerve receptors go out of action before others (epicritic before protopathic) leaving nociceptors to record certain sensations of vulval sensibility. But this disappears quickly in the large majority of women and there is almost complete anesthesia of the perineum within one half to three quarters of an inch of the vulval margin. There is no pain. The woman feels only a sudden release, and afterwards what appears to be a massive laceration, which if it occurred in any other part of the body would cause considerable pain, has been sustained almost without her knowledge, and she is disappointed when she is asked to submit to the insertion of stitches.

This description of the actual birth of the child is certainly different from that to which modern obstetrics is accustomed. This reintroduction of a method which women of earlier generations had to accept for obstetric care is not, in our opinion, compatible with the best interest of either mother or child. The prolonged second stage necessary to distend the perineum and cause such a demolition of the perineal tissues of the mother, in order to allow the baby to be born in the manner so vividly described above, must on occasion produce severe brain trauma to the fetus.[40] The fact that perineotomy may on occasion be resorted to by the advocates of this method "when the perineum is blanching" is simply a bow to the value of the procedure without the performance of the operation at the proper time. Should one wait for the blanching effect of the perineum, the levator ani muscles and the fascia of the pelvic floor would have already become so severely damaged and separated from each other that reestablishing the support to the pelvic floor would become an unsatisfactory procedure. The inability to reestablish this support adequately will result in gynecologic lesions that will need surgical attention at some later date.[40b] In a well documented study of 2,800 primiparas—95 per cent of whom were delivered by hospital interns—Aldrich and Watson clearly showed that the use of perineal incision and elective low forceps gave superior results with respect to fetal mortality and permanent vaginal injuries. With the use of frequent elective low forceps (26 per cent) and the routine use of episiotomy performed at the correct time, the pelvic tissues at the follow-up examination showed healing and good perineal support.[41] Only preliminary

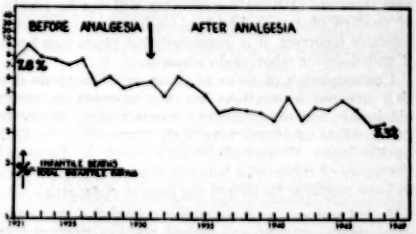

Fig. 2.—Chart showing the continued decrease in the infantile death rate (including all stillbirths and neonatal deaths occurring after the twenty-eighth week of gestation) at the Boston Lying-in Hospital from 1921 to 1949, before and after the introduction of analgesia. (Rates are charted on a logarithmic scale.)

36. Read,[a, b, c] Goodrich and Thoma.[a]
37. Hingson, R. A., and Lull, C. B.: Control of Pain in Childbirth, ed. 3, London, J. S. Lippincott Company, 1948.
38. Irving, F. C.; Berman, S., and Nelson, H. B.: Barbiturates and Other Hypnotics in Labor, Surg., Gynec. & Obst. **58**:1, 1934.
39. Hershenson, B. B.: Premedication and Anesthesia in Obstetrics, New England J. Med. **239**:429, 1948.
40. (a) DeLee, J. B.: The Prophylactic Forceps Operations, Am. J. Obst. & Gynec. **1**:34, 1920-1921. (b) Aldridge, A. H., and Watson, F.: The Analysis of End Results of Labor in Primiparas After Spontaneous Versus Prophylactic Methods of Delivery, Am. J. Obst. & Gynec. **26**:554, 1933. (c) Dunster, E. S.: The Use of Obstetric Forceps in Abbreviating the Second Stage of Labor, Tr. Mich. M. Soc. 1877-1880, pp. 107-137.
41. Nelson, H. C., and Abramson, D.: The Advantages of Conservative Obstetrics As Shown by Examination Six Weeks Post-Partum, Am. J. Obst. & Gynec. **41**:800, 1941.

and incomplete data, concerning specially selected patients, have thus far been presented about the results of "natural" childbirth.[42] Until the standard obstetric data are presented regarding the length of the different stages of labor as well as the total length of labor, the type and incidence of operative deliveries, the maternal, fetal and infant morbidity and mortality and the condition of the pelvic tissues when examined late in the puerperium, as well as many other items of an obstetric nature, one cannot draw any conclusion regarding the soundness of the obstetrics of "natural" childbirth. Until this is possible, the method cannot be recommended for use in modern obstetrics except under controlled experimental conditions.

COMMENT

We have examined and evaluated some of the present day trends pertaining to personal and psychologic aspects of pregnancy. Many of the claims and conclusions regarding the question under discussion were found to be unsupported by scientific data. They are based on assumptions and sometimes unclear statements. One might argue fruitlessly each point indefinitely, taking up interesting pros and cons, but until real facts are at hand the answers will not be known. If modern obstetrics has become inhuman or psychologically incorrect, it is important that physicians know it and discover what to do about it.

Contemplation of some of these views suggests that they are not innovations but are attempts to revive old beliefs and old practices. Some aspects of one of the identical problems were aptly summarized in 1847 by Sir James Y. Simpson,[43] who stated, in discussing the views of those who believed it was bad for women to have medicine to relieve the pain of childbirth:

> Medical men will, no doubt, earnestly argue that their established medical opinions and medical practices should not be harshly interfered with by any violent innovations of doctrine regarding the non-necessity and nonpropriety of maternal suffering. They will insist on mothers continuing to endure, in all their primitive intensity, all the agonies of childbirth as a proper sacrifice to the conservation of the doctrine of the desirability of pain. They will perhaps attempt to frighten their patients into the medical propriety of this sacrifice of their feelings, and some may be found who will unscrupulously ascribe to the new agency any misadventure, from any causes whatever, that may happen to occur in practice. . . .

We had intended to examine only the psychologic side of the assertions about pregnancy and childbirth. However, in reviewing this literature, we found conspicuous gaps in the obstetric aspects of the subject which demanded attention. It was readily observed that basic obstetric data were lacking from these reports, and it is not clear whether the "psychologically based" practices represent good obstetrics.

Scientific psychology and scientific obstetrics are not incompatible. However, it would appear hazardous at this stage of its development to allow pure psychologic speculation to determine obstetric decisions. Emphasis on the psychologic aspects of this problem should not obliterate the teaching of sound obstetrics.

42. Read, G. D.: Observations on a Series of Labours with Special Reference to Physiological Delivery, Lancet **2**:721 (April 30) 1949. Thoms, H., and Goodrich, F. W.: Training for Childbirth, J. A. M. A. **140**:1256 (Aug. 20) 1949.

43. Simpson, J. Y.: Remarks on the Superinduction of Anesthesia in Natural and Morbid Parturition, with Cases Illustrative of the Use and Affects of Chloroform in Obstetric Practice, Boston, William B. Little & Company, Chemists and Druggists, 1848.

CONCLUSIONS

1. Modern obstetrics has participated in many recent therapeutic advances, such as chemotherapy and blood transfusions, which are based on scientific facts and which definitely have been important in the improved care of mother and child. Since modern obstetrics shows an encouraging record of advances in fundamentals, such as improved maternal and fetal mortality rates, suggestions related to the return to previous obstetric practices demand critical evaluation before they are adopted.

2. There is a current myth which states that primitive women have babies with greater ease and less pain than do modern women. Examination of the anthropologic literature shows that there is absolutely no factual basis for this notion.

3. Many ideas, such as the effect of prenatal maternal influences on the infant, concerning the relationships of mother and child have appeared over the ages. Some of these ideas are valid and some are not.

4. Extravagant claims have been made recently which suggest (*a*) that labor really is not painful or (*b*) that it is painful but that the pain is psychologically necessary for the mother. Some persons may hold both views, although they seem to be mutually contradictory. There are no factual data to support these notions.

5. It has been stated that psychologic harm accrues to the child raised in the nursery and not at his mother's bedside and that without nonscheduled breast feeding the child may have a blighted psychologic future. These claims are not based on substantial data and may be frightening to mothers.

6. Since these ideas are based on unproved psychiatric and anthropologic speculations and not on facts, they are premature as practical guides to obstetric management or to hospital procedure.

7. The obstetric details and results of the type of obstetric practices in which psychologic interests predominate have not yet been reported and await further evaluation.

8. Scientific psychology and scientific obstetrics are not incompatible.

9. The correct answers to questions raised by some present day claims about the personal and psychologic aspects of pregnancy await scientific investigation in the future and will not be known until properly controlled studies are made.

ABSTRACT OF DISCUSSION

DR. SPRAGUE H. GARDINER, Indianapolis: This critical review by Drs. Reid and Cohen is both timely and necessary. They have shown that the claims of psychologic harm resulting from the routine nursing care in maternity hospitals have not been proved, and they have also shown that the psychologic benefits of the so-called natural childbirth have not been proved. Several years ago, at the Johns Hopkins Hospital, I had the opportunity of carrying on a psychosomatic investigation of various obstetric problems. As part of the study, my associates and I chose 15 normal pregnant women and followed them through the antepartum course, through delivery and through the postpartum period in an endeavor to discover the normal psychologic reactions to these experiences. These women were managed during their labor according to the routine of the clinic, and they received analgesia and anesthesia as indicated. Our conclusions, based on careful postpartum follow-up were: 1. These women were grateful for the relief

of pain afforded them during their delivery, and none felt that there had been any interference with the full happiness of becoming a mother as a result of the analgesia and anesthesia. 2. They all experienced a genuinely healthy mother-child relationship. The type of infant feeding, whether by breast or bottle or on the hour or on demand, seemed to make little difference in determining the quality of the mother-child relationship. 3. There were specific personality and situational factors which did enable these women to make a normal adjustment to pregnancy and labor and which later enabled them to develop healthy mother-child relationships. These factors were not related to the exact experience of labor, nor were they related to the exact experience of nursing. They were related to the degree of maturity of personality of the patients, the degree of stability and love in the environment and the strength of the genuine desire for the pregnancy and the child. There is need for careful psychosomatic study of many obstetric problems. Information obtained by sound methods of psychosomatic research will definitely augment obstetric knowledge and permit continued improvement in the management of obstetric patients.

DR. GORDON R. KAMMAN, St. Paul, Minn.: I am not sure that the conclusions based on the reports of 196 women physicians who had babies is particularly convincing. Their so-called education to the facts of pregnancy was acquired relatively late in their lives. The attitude of a woman toward the pain of childbirth is more basic and has its origins much earlier in life, probably in the first ten years. In order to interpret the reaction to the pain of childbirth, physicians really should study the attitude of the mother's mother on the attitude of the mother with whom they are dealing. What was the semantic orientation? In a particular family is it a traditional requirement that childbirth be inescapably painful? Regarding the question of whether pain is psychologically necessary for the woman, I am in complete agreement with Drs. Reid and Cohen. I have known a number of women for whom childbirth has been practically painless, and they are normal mothers. If any women fail to develop love for their newborn children, I am convinced that it is not because they failed to have a painful delivery. The most frequent cause for the emotional blunting is a postpartum neurosis or psychosis. Does the infant suffer permanent psychologic damage from nursery care? Theoretically, the mother and infant should be together as much as possible after the birth of the child. Rene Spitz of New York, in an illuminating study of the growth and development of foundlings as compared with children nursed and cared for by their own mothers, found that emotional deprivation, and emotional deprivation alone, could have a devastating and sometimes fatal effect on the infant. However, I do not feel that the first few days in the hospital are as important as some believe, although I do believe that the mother should assume full charge and permit the infant to enjoy the anaclitic relationship as soon after birth as possible. Should the baby be breast fed every time it cries? Although crying is a form of evocative speech, it is undifferentiated. Therefore, unless the various causes for crying were investigated each time the infant cried and a differential diagnosis were made by the mother or mother substitute, I cannot see the rationale of the belief that an infant should be fed every time it cries. Moreover, if oral gratification is equated with relief of all forms of physical discomfort, it is conceivable that a generation of orally fixated persons could be produced.

DR. ARTHUR JENNINGS MANDY, Baltimore: Read's contribution, "Childbirth Without Fear," has been widely misinterpreted by the medical as well as the lay public, to mean childbirth without pain. It is doubtful that Read ever contended that all women could have babies without labor pains, at least I have thus far not been able to find such claim in any of his published work. Read intended to emphasize that with a better interpersonal relationship between the expectant mother and her attending physician, the amount of analgesic drugs employed in labor could be reduced. With this in mind, I believe the point is in good order. Drs. Cohen and Reid are correct in the data they have presented. The elaborate rituals developed by primitive peoples for the relief of pain in childbirth and preserved throughout the centuries indicate that the tribal woman also experienced considerable discomfort. I concur with Dr. Gardiner's impression of the emotional immaturity of many of the women who have been delivered by natural childbirth. This immaturity can be repeatedly demonstrated in the routine replies of patients to postpartum questionnaires. Such apologetic statements as, "I am sorry that I did not behave too well, but I will try to do better next time," characterize the anxious-to-please, immature type of personality. The hysterical person, moreover, can often develop conversion phenomena, and this represents the type of patient and mechanism (modification of hypnosis) that frequently is easily adapted to Dr. Read's technic. Dr. Read has made a point of stressing that his work is not related to hypnosis. I have been able, nevertheless, in my work at the Sinai Hospital in Baltimore, to induce complete anesthesia, sufficient to introduce a trocar in a patient's extremity, by means of what Dr. Read describes as simple relaxation technic. I call it hypnosis. My associates and I believe that relaxation exercises and suggestion are merely modifications of hypnotic technics, which form the basis on which a reduction in analgesic drugs can be accomplished. Physicians should bear in mind that no one is trying to eliminate the administration of analgesia but that some persons are simply trying to minimize it to levels of safety for both mother and child.

DR. DUNCAN E. REID, Boston: To humanize medical care and to create an atmosphere of friendliness in hospitals is a most laudable purpose. To expel the fears and anxieties that patients have toward medical institutions and procedures is an important part of the art of medicine and certainly is not restricted to any particular phase of medical practice. Some physicians possess the ability to obtain the confidence of the patient more easily than others. With respect to the maternity patient, the ability to accomplish this is a most valuable asset. Certain technics may be developed which appear to abolish fear and readily establish confidence. No doubt these technics have not been completely exploited in all fields of medicine. It has always been evident to the discriminating physician that detailed explanation of the patient's treatment by demonstration or by detailed description might sometimes create additional fears and apprehensions. Regardless of the technics to be used, the maternity patient will develop confidence in her physician if she has a feeling of assurance that the proper procedure will be done at the proper time and in the proper manner. In this particular instance, the problems in question are no doubt complex, and to suggest dogmatically at this time that one way is superior to another will deter the further accumulation of scientific knowledge in the field of maternal and child health. Solution to these problems will require more data than will many other medical problems, for these questions must not be answered by decision, authority or analogy or by attempting to work out the answers from unproved psychologic theories. The answers await further scientific work.

Patience, Delicacy and Secrecy.—Patience and delicacy should characterize the physician. Confidences concerning individual or domestic life entrusted by patients to a physician and defects in the disposition or character of patients observed during medical attendance should never be revealed unless their revelation is required by the laws of the state. Sometimes, however, a physician must determine whether his duty to society requires him to employ knowledge, obtained through confidences entrusted to him as a physician, to protect a healthy person against a communicable disease to which he is about to be exposed. In such instance, the physician should act as he would desire another to act toward one of his own family in like circumstances. Before he determines his course, the physician should know the civil law of his commonwealth concerning privileged communications.—Section 2, Chapter II of the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

THE CERVICAL SMEAR IN OFFICE PRACTICE

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This survey was undertaken to determine the value of the cervical smear to the practicing physician. Most reports on the usefulness of the cytologic examination have come from hospitals, clinics or cancer detection centers.[1] Only a few reports discuss the value of this examination to the practicing physician and, in particular, to the gynecologist.[2] This report describes the results obtained from a study of the cervical smears of 200 consecutive patients seen in a gynecologist's office. Smears were taken routinely on all patients above the age of 35, regardless of the presenting symptoms or physical conditions. Smears were prepared on 69 patients younger than 35 years of age because specific information could be gained from a cytologic examination. The clinical diagnoses for these 200 patients are listed in table 1.

All smears were taken in the physician's office as part of the complete gynecologic examination. The slides were stained and examined in a cytology laboratory.[3] The findings of the cytologic examination of the cervical smears are summarized in table 2.

Slides from 6 patients were found to contain malignant cells. The diagnosis of carcinoma was confirmed histologically in all 6 cases. Five patients had epidermoid carcinoma of the cervix, and 1 had an adenocarcinoma of the uterine body. Three of these 6 patients with carcinoma had lesions that would have been recognized clinically, without the help of a laboratory examination. The other 3 patients, however, were not clinically suspect on the basis of either the history or the pelvic conditions. Cytologic investigation of the secretion collected by suction from the external cervical os showed malignant cells to be present. We would like to summarize these 3 cases.

REPORT OF CASES

CASE 1.—The patient, a 39 year old married woman, unipara, had a yellow vaginal discharge of two months' duration. The menstruation had been perfectly regular without any alteration in the menstrual pattern. This patient had an obvious cancer phobia. She was complaining of nervous tension with sensations of smothering. Her family physician had been giving her 10,000 units of estrogenic hormone weekly for the three months prior to the date of examination. She had noted improvement of her nervous tension under this regimen. Pelvic examination showed severe chronic infection and erosion of the cervix. The remainder of the pelvic examination showed no abnormalities except some slight tenderness in the right adnexal region. On the first examination a cervical smear was taken, but no therapy was given for the cervical erosion because the patient was anticipating a menstrual period within a day or two and it was not felt that cauterization was advisable at this time. The smear consisted almost entirely of abnormal cells. They were large, well differentiated cells with ample cytoplasm; their nuclei were abnormally large and dark-staining, with irregular chromatin granules and patches and prominent nucleoli, a picture found in malignant cells. A biopsy showed a preinvasive epidermoid carcinoma of the cervix. The patient was treated with preoperative roentgen radiation followed by a Wertheim operative procedure and Taussig gland dissection.

CASE 2.—The patient was a 38 year old married woman, quintigravida, quadripara, who stated, ". . . each month I do menstruate but mostly have a watery discharge without any color." Five years prior to this visit she had had a diagnostic curettage for menstrual irregularities. The pathologic diagnosis is not known. Subsequently, her menstruation did not return for eighteen months. She was then given hormonal therapy for four months. She started to have cyclic, scant bleeding which lasted a day or a day and a half. This pattern of her menses had persisted to the present visit. Pelvic examination showed that the entire vaginal wall was thinner than normal and that the fornices were beefy red in appearance. This color extended over the portio vaginalis of the cervix. The cervix was of normal consistency but bled on manipulation. The clinical impression was that of a severe vaginal infection, but the

TABLE 1.—*Clinical Diagnoses of 200 Patients Studied Cytologically*

Diagnosis	Number of Patients: Under 35 Years of Age	Number of Patients: Over 35 Years of Age	Total
Chronic cervicitis and/or erosion	40	32	72
Vaginitis	..	14	14
Myoma uteri	..	10	10
Postmenopausal bleeding	..	4	4
Menometrorrhagia	11	7	18
Amenorrhea or oligomenorrhea	7	..	7
No disease, came in for check-up	..	53	53
Sterility	10	2	12
Cancer of cervix	..	3	3
Miscellaneous	1	6	7
Total	69	131	200

TABLE 2.—*Results of Cytologic Examination of 200 Cervical Smears*

Cytologic Examination	Cervical Smears	Percentage
Negative (Class I and II) *	188	...
Positive (Class IV and V)	6	3.0
Class III	5	2.5
False positive	1	...
False negative	0	...
Total	200	

* Papanicolaou classification [1c]:

Class I.—Absence of abnormal or atypical cells.
Class II.—Atypical cells present but without abnormal features.
Class III.—Cells with abnormal features but not sufficiently pathognomonic.
Class IV.—Fair number of pathognomonic cells and cell clusters.
Class V.—Large number of conclusively pathognomonic cells and cell clusters.

Dr. Jacob D. Goldstein, Director of Laboratories, Genesee Hospital, made available the pathologic specimens used in this survey. Miss Gertrude Kohn prepared all the stained slides for cytologic examination.

Fellow in Obstetrics and Gynecology, University of Rochester School of Medicine and Dentistry (Dr. Peters) and Assistant Obstetrician and Gynecologist, University of Rochester School of Medicine and Dentistry and Attending Obstetrician and Gynecologist, Genesee Hospital (Dr. Madden).

1. (a) Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear, The New York Commonwealth Fund, 1943. (b) Gates, O., and Warren, S. A.: Handbook for the Diagnosis of Cancer of the Uterus by the Use of the Vaginal Smear, Cambridge, Mass., Harvard University Press, 1947. Scheffey, L. C., and Rakoff, A. E.: An Evaluation of the Cytology Test for Uterine Cancer, M. Clin. North America **32**: 1363, 1948. Mackenzie, L. L.; Wetchler, B. B.; DuBois, J. C., and Neustaedter, T.: The Use of the Vaginal Smear in a Gynecologic Service, Am. J. Obst. & Gynec. **55**: 821, 1948. McSweeney, D. J., and McKay, D. G.: Uterine Cancer: Its Early Detection by Simple Screening Method, New England J. Med. **239**: 867, 1948.

2. Freemont-Smith, M., and Graham, R. M.: The Vaginal Smear: Its Value to the Internist, J. A. M. A. **137**: 921 (July 10) 1948.

3. Supported by the Monroe County Branch of the American Cancer Society.

possibility of an early malignant process could not be ruled out. The cervical smear showed acidophilic squamous cells of varying sizes with large hyperchromatic nuclei which showed anisonucleosis, poikilonucleosis and multiple and large nucleoli. Most of these cells showed a disturbance of the cellular-nuclear ratio. The cells were interpreted as malignant. A biopsy confirmed the diagnosis as early invasive epidermoid carcinoma of the cervix. A Wertheim operation without preoperative radiation was done.

CASE 3.—The patient was a 64 year old woman who had gone through the menopause at the age of 50. For fifteen months prior to her first visit she had noted monthly episodes of pinkish spotting, which lasted one to three days. Pelvic examination showed a moderate amount of atrophic vaginitis. The cervix was short and of normal consistency. The uterus could not be well outlined because of the obesity of the patient, but it was felt to be of normal size. It was thought that this patient might have a granulosa cell cyst of the ovary. The cervical smear showed clusters of endometrial cells which were estrogen-induced atypical hyperplasia of the endometrium will at times be especially puzzling to the cytologist, just as tissue from a hyperplastic endometrium might puzzle the pathologist.

One patient whose slides were interpreted as class III (case 4, table 3) at the age of 51 had had a period of amenorrhea lasting two and one-half months. A short episode of spotting then developed. This event brought her to the gynecologist's office. No abnormalities were found on examination. A cervical smear showed atypical groups of endometrial cells which we were not able to class as definitely benign. A diagnostic curettage could not be done. The patient was followed closely, and smears were taken at each office visit. All subsequent smears were negative, and no endometrial cells were seen in any of the follow-up smears. Her symptoms have not returned, and she is well subjectively and objectively at the time of writing, one year after her initial visit.

TABLE 3.—*Cytologic and Pathologic Results of 5 Cases in Which the Cervical Smears Were Interpreted as Class III*

Case	Age	Estrogen Therapy	History and Clinical Findings	Cytologic Interpretation	Pathologic Diagnosis
1	48	None	Abnormal bleeding for 25 days; foul discharge from cervix	Groups of columnar cells with anisonucleosis and hyperchromatism of the nucleus	Endometrial hyperplasia
2	80	Diethylstilbestrol intermittently for 5 years	Irregular vaginal bleeding; bloody drainage from cervix	Columnar cells with hyperchromatic and atypical nuclei	Endometrial hyperplasia; submucous fibroma
3	63	None	Bleeding for 3 weeks, followed by pinkish discharge; fibroid uterus	Columnar cells with hyperchromatism and degeneration of the nucleus; vacuolization of cytoplasm	Endometrial hyperplasia; myoma uteri; endometriosis of ovary and cervix
4	51	None	Amenorrhea for 2½ months; one episode of spotting; no abnormalities on examination	Atypical cell groups with crowding, vacuolization of cytoplasm and hyperchromatism of nuclei	None; this patient was followed with smears, which have been negative, at frequent intervals; the patient was well and without symptoms one year after the initial Class III smear
5	40	None	Bloody discharge daily for the last 3 months; cervix is large and shows a central erosion; uterus tender, 1½ times normal size	A few cells with large, decidedly hyperchromatic nuclei; one group with abnormal nuclei	Preinvasive carcinoma of the cervix? Benign?

characterized by vacuolization of the cytoplasm and abnormal nuclei. These were interpreted as malignant cells coming from the endometrium. A diagnostic curettage and a hysterectomy were performed. The histologic examination showed adenocarcinoma of the endometrium; the left ovary contained a Brenner tumor.

Not all slides could be definitely interpreted as either showing or not showing the presence of malignant cells. In five instances cells which had abnormal features but which were not sufficiently pathognomonic (class III, table 2) were found in the cervical secretion. This demonstrates the difficulties a cytologic examination might present.[4] Table 3 summarizes the cytologic and pathologic results found in 5 cases in which the cervical smears were interpreted as class III.

Three patients in this group had hyperplasia of the endometrium. In the beginning of our work we had, at times, difficulty in differentiating endometrial cells coming from a hyperplastic endometrium from those being shed by an adenocarcinoma. Cells shed from an

Another patient (case 5, table 3), aged 40 years, had had a bloody vaginal discharge for the three months prior to the date of examination. Examination showed a large cervix with a central erosion; the uterus was tender and one and one-half times the normal size. Cytologic examination of the smear showed a few cells with large, definitely hyperplastic nuclei. One group of cells with abnormal nuclei was present. The histologic sections were examined by three pathologists: two considered the lesion a preinvasive epidermoid carcinoma, and one considered it benign (this case will be reported in detail later).

One smear of a patient among the 200 examined was reported as positive, but no other evidence of cancer could be found, though biopsy was performed. The patient, a 75 year old woman, had been well until three days before examination, when she had noticed vaginal bleeding. She had gone through menopause at least 20 years before. Examination showed no abnormal findings other than bleeding from the cervical canal. The

4. Peters, H.: The Vaginal Smear: The Ease and Difficulty of Its Evaluation, Cancer 2:615, 1949.

cervical smear showed abnormal cells which were interpreted as endometrial cells. Histologic examination of the material obtained at curettage showed atypical endometrial hyperplasia. The patient is being followed closely. At the time of this report (three months after the diagnostic curettage) she has not had any more bleeding, and no abnormal cells have been found in subsequent smears.

No false negative smear (negative smear but positive biopsy) was found in this group.

COMMENT

One hundred and eighty-eight cervical smears were reported as class I or II (negative for malignancy). Though a negative smear is not an absolute criterion that malignancy is not present (as negative results from biopsy cannot be used as certain proof of the absence of cancer), we feel it is of significance if it corroborates a clinical impression. This is demonstrated by our experience in this group with patients who had cervical erosion and/or cervicitis. Ideally, perhaps, biopsy should be performed in all cases of cervical erosion (and cervicitis) before local treatment is instituted. Realistically, however, in office practice a biopsy specimen is too often not taken, and local treatment is started as soon as clinical examination and diagnosis is made.

Seventy-two patients in this group were found clinically to have cervical erosion and cervicitis, and seventy smears corroborated this impression. In 2 cases, however, the smear showed malignant cells to be present, and subsequent histologic investigation proved the patients to have early cancer of the cervix. Prior to the use of the cervical smear as part of a routine examination, these patients would have been treated locally, which undoubtedly would have prolonged the interval before discovery of the true nature of the lesion, and treatment for cancer would thus have been delayed.

However, more can be learned from a negative cervical smear than that no malignant cells are seen. A cytologic interpretation can be of decided help in guiding the gynecologist in endocrine therapy of the menopause, in patients with difficulties of functional bleeding, in hyperestrinism, in anovulatory cycles and in sterility and other problems.

Much can be learned from the cervical smears of those patients who have carcinoma of the cervix and who are treated by radiation therapy. Daily study of the cervical cytology during radiation therapy can give information about tumor response and probable ultimate prognosis. Moreover, if one is familiar with the cell changes during radiation therapy and if one has watched a positive smear become free of malignant cells after radiation therapy is completed, then reappearance of malignant cells in the smear at a later date becomes significant.

More and more women are coming to the gynecologist's office for a "cancer check-up." Public education is showing results, and yearly examinations are being requested. In these cases, cervical smears should be taken as part of the complete examination. Some criticism has been voiced that a negative smear report might result in a false sense of security on the part of the physician as well as the patient. This criticism would be correct if the physician based his diagnosis only on the cervical smear. If, however, the cytologic interpretation is used to corroborate a detailed history and physical examination and not to displace them, then the cervical smear must be considered an additional tool in the discovery of cases of carcinoma.

If the cervical smear should become part of a complete gynecologic examination, as we believe it should, a few facts must be stressed in the procedure of preparing a satisfactory slide, which is of utmost importance for satisfactory interpretation. The preparation of the cervical smear is an office procedure only in the sense that the slide for cytologic examination can easily be prepared in the office. The staining and examination of the slide, however, is a laboratory procedure and should be in the hands of a person trained in the cytology of the female genital tract.

The collection of material for a vaginal or cervical smear is simple, but two points, which we have come to regard as important, must be stressed. The patient should be instructed to present herself at the physician's office without having taken a douche. This simple rule is difficult to enforce, as it means a reeducation of the patient. The woman, in an effort to present herself as clean as possible, will, unless specifically instructed to the contrary, invariably take a douche before going to the physician. The douche, however, succeeds in washing away the valuable collection of desquamated cells on which a satisfactory cytologic interpretation depends.

Another important point is that the smear be prepared before a bimanual vaginal examination is made. A speculum should be inserted into the vagina with little or, preferably, no lubricating agent on it and material for the smear collected. This means a reeducation of the physician, who has been used to doing a palpatory examination before the insertion of a speculum.

SUMMARY

1. The results of the cytologic examination of cervical smears from 200 consecutive gynecologic patients are presented.

2. Among these 200 cases there were 6 cases of carcinoma, 3 of which were primarily discovered through the taking of a cervical smear.

3. The value of the smear, other than in the discovery of uterine malignant changes, is discussed.

4. Two factors in preparing a satisfactory smear for cytologic examination are stressed.

Precedence When Several Physicians are Summoned.—When several physicians have been summoned in a case of sudden illness or of accident, the first to arrive should be considered the physician in charge. However, as soon as is practicable, or on the arrival of the acknowledged personal or family physician, the first physician should withdraw. Should the patient, his family or his responsible friend wish some one other than he who has been in charge of the case, the patient or his representative should advise the personal or family physician of his desire. When, because of sudden illness or accident, a patient is taken to a hospital without the knowledge of the physician who is known to be the personal or family physician, the patient should be returned to the care of the personal or family physician as soon as is feasible.—Section 6, Chapter III of the PRINCIPLES OF MEDICAL ETHICS of the American Medical Association.

PAPILLARY NECROSIS OF THE KIDNEY

A Clinical and Experimental Correlation

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Papillary necrosis of the kidney is reported infrequently in the literature and is only rarely diagnosed during life. During the past year, we have encountered 3 morphologically proved cases as well as others in which such proof is lacking but which clinically were apparently in accord with this diagnosis. Since the original description of this condition by Friedreich in 1877,[1] papillary necrosis of the kidney (necrotizing renal papillitis) has been considered by most observers as a manifestation of pyelonephritis which occurs usually as a complication of diabetes mellitus.[2] However, as shown by Edmondson, Martin and Evans[3] in their recent review of this subject, 40 per cent of their cases occurred in nondiabetic patients with urinary tract obstruction. Among the few experimental observations are those of Mallory, Crane and Edwards,[4] who produced the lesion in rabbits by ligating one ureter and subsequently injecting pathogenic organisms intravenously. Our own approach to the subject resulted from the observation that the lesion could be readily induced in dogs by the ligature of one or both ureters in the absence of pyelonephritis.

The present paper includes a clinicopathologic report of the 3 patients suffering from papillary necrosis observed recently as well as experimental studies which we believe elucidate the pathogenesis of this disorder.

REPORT OF CASES

CASE 1.[5]—*Clinical Observations.*—A white man aged 49 was examined in January 1948. In 1917 his left kidney had been incised and drained for six weeks. Nephrectomy was advised at that time but was refused by the patient, who remained asymptomatic until six months prior to admission. At this time he had abdominal pain, which was followed shortly by nausea and vomiting. Physical examination demonstrated a thin, chronically ill patient. The blood pressure was 110 mm. of mercury systolic and 70 diastolic; the pulse rate was 90 and the temperature 103.8 F. There was a fluctuant mass in the region of the right kidney. Retrograde pyelography revealed pronounced bilateral hydronephrosis. A right nephrostomy was performed, and turbid urine under pressure was obtained. Two days later bleeding occurred from the surgical wound and continued periodically. During the following nineteen days, 11 liters of blood were given for this troublesome bleeding. The patient continued downhill, with mounting azotemia, and he died forty-one days after admission.

The daily urinary volume during the patient's stay in the hospital varied between 800 and 1,500 cc. The blood pressure remained approximately 100 mm. of mercury systolic and 60 diastolic throughout this period; the temperature ranged between 99 and 104 F.; the white blood cell count fluctuated between 9,450 and 26,300. The blood urea level rose gradually from 205 to 360 mg. per hundred cubic centimeters for twenty-nine days, and then rose abruptly to 460 mg., where it remained until his death.

Autopsy Observations.—The body was emaciated, and there were decubital ulcers over the sacrum. A well healed nephrostomy scar was present on the left, with a recent nephrostomy wound on the right. The left kidney weighed 385 Gm. and measured 30 by 12.5 cm. It was distended with over 1 liter of a turbid, thin fluid. The parenchymal remnant averaged 0.25 cm. in thickness. The left ureter was angulated and obstructed 2 cm. below its origin. It was also decidedly stenosed at its junction with the bladder. The right kidney weighed 350 Gm. and had a posterior nephrostomy opening. The pelvic lining and nearby parenchyma of each kidney was whitish and granular. The other viscera were grossly normal.

On microscopic examination, the kidneys displayed papillary necrosis of coagulation type (fig. 1). The tips of the papillae and nearby areas were necrotic and contained a fibrinoid

Fig. 1 (case 1).—A necrotic papillary tip. The necrosis is of coagulation type and is bordered by a thick zone of macrophages. The dilated and disrupted major collecting tubules are seen inside of the macrophage layer (slightly reduced from a magnification of × 150).

substance and recent interstitial hemorrhages. These zones of necrosis were bordered by a layer of macrophages. The renal parenchyma was atrophic, with severe dilatation of the distal segments and collecting tubules. There were multiple interstitial collections of lymphocytes and plasma cells.

This patient had an obstructive uropathy of long standing. The hydronephrosis was associated with coagulation necrosis of the renal papillae and chronic pyelonephritis. It seems apparent that papillary necrosis occurred first on the left side. When the right side became prominently affected by the same process, a progressive and fatal renal excretory failure developed.

CASE 2.—*Clinical Observations.*—A Negro woman aged 67 was admitted to the hospital in a state of coma. She had complained of pain in the abdomen for five days, during which period no food or water had been taken. Two days before admission she had become irrational.

This work was supported by a grant from the Life Insurance Medical Research Fund.

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Read before the Section on Urology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

1. Friedreich, N.: Ueber Necrose der Nierenpapillen bei Hydronephrose, Virchows Arch. f. Path. Anat. **69**:308, 1877.
2. Robbins, S. L.; Mallory, G. K., and Kinney, T. D.: Necrotizing Renal Papillitis: A Form of Acute Pyelonephritis, New England J. Med. **235**:885, 1946. Stevens, R. J.; Werthammer, S., and Pearson, J. S.: Renal Papillary Necrosis Complicating Diabetes Mellitus, West Virginia M. J. **44**:1, 1948.
3. Edmondson, H. A.; Martin, H. E., and Evans, N.: Necrosis of Renal Papillae and Acute Pyelonephritis in Diabetes Mellitus, Arch. Int. Med. **79**:148 (Feb.) 1947.
4. Mallory, G. K.; Crane, A. R., and Edwards, J. E.: Pathology of Acute and of Healed Experimental Pyelonephritis, Arch. Path. **36**:330 (July) 1940.
5. From the clinical material of Dr. H. A. O'Brien.

Physical examination revealed a pulseless and cyanotic patient with obvious extracellular fluid deficit as evidenced by poor skin turgor and soft eyeballs. The temperature was 103 F. The abdomen was decidedly distended; no peristaltic sounds were heard. The patient died soon after admission.

Autopsy Observations.—The small intestines were greatly distended, with the loops adherent by fibrinous exudate. Multiple

Fig. 2.—Appearance of right kidney after ligation of right ureter for seven days. In addition to decided hydronephrosis and hydroureter the parenchyma is much paler than the unobstructed control and the capsular veins are greatly engorged.

abscesses were present in the lower abdominal wall. The heart, lungs and liver were grossly normal.

The right kidney weighed 200 Gm. and was essentially normal. The left kidney was densely adherent to its surroundings. A suppurative exudate extended from the upper pole of the kidney along the left paracolic gutter to the pelvis. On section the kidney showed pronounced dilatation of the pelvis and calices. The mucosa of the pelvis was intensely hyperemic, and the tips of several pyramids were grayish white. Several cortical abscesses extended to the perinephritic inflammation. Although the left ureter was dilated throughout, no source of obstruction was identifiable.

Microscopically, the right kidney revealed slight arteriosclerosis. The left kidney had the atrophic appearance of moderately advanced pyelonephritis and hydronephrosis. The medulla next to the calices was necrotic and coated with a fibrinoid layer containing many neutrophilic leukocytes (papillary necrosis). The adrenal gland was the seat of tubular degeneration of the cortex.

This patient had a decided unilateral hydronephrosis associated with necrotizing papillitis and chronic pyelonephritis. The pyelonephritis was complicated by perinephritic suppuration, retroperitoneal extension toward the pelvis, and peritonitis. Since this was a unilateral process, it was most likely not a complication of diabetes mellitus. If it had been diagnosed earlier it would have been amenable to satisfactory surgical therapy. As pointed out by Rich,[6] the tubular degeneration of the adrenals probably indicates prolonged terminal peripheral circulatory failure. The patient did not survive long enough for diagnostic studies.

CASE 3.—*Clinical Observations.*—A Negro woman aged 47, a known diabetic patient for six years, had been hospitalized several times with complications arising from failure to follow a diabetic regimen. On the final hospitalization she was admitted in deep coma. She had not taken insulin for some months. Physical examination revealed an emaciated woman who did not respond to the usual stimuli. The eyeballs were soft and the skin turgor was poor. The blood pressure and radial pulse were imperceptible, and the respiration was of the Cheyne-Stokes type. The blood sugar level was 58 mg. per hundred cubic centimeters, the carbon dioxide-combining power 55 volumes per cent and the plasma chloride concentration 104 milliequivalents per liter. The patient died shortly after admission.

Autopsy Observations.—The kidneys were of similar appearance, the right kidney weighing 330 Gm., the left 310 Gm. The capsule stripped with difficulty, leaving a finely granular surface. Throughout the cortex there were numerous small abscesses. The pyramids were yellowish gray and the mucosa of the pelvis uniformly gray in color.

Microscopic examination of the kidneys revealed multiple foci of suppuration in the cortex. The inner halves of the pyramids demonstrated both coagulation necrosis and focal suppuration. There was decided dilatation of the cortical tubules.

Other observations included generalized arteriosclerosis, acute pericarditis and pancreatic fibrosis.

A known, uncooperative diabetic patient lapsed into coma and pursued a rapidly downhill course. The main observations at autopsy were those of suppurative pyelonephritis and necrotizing papillitis. In view of the terminal laboratory and renal studies, the coma apparently resulted from renal failure rather than from diabetic acidosis.

Summary.—These 3 proved cases of papillary necrosis of the kidney illustrate the devastating effects of this lesion. Involving as it does the junction of the collecting tubules and the calices, the resulting block renders the excretion of waste products from the

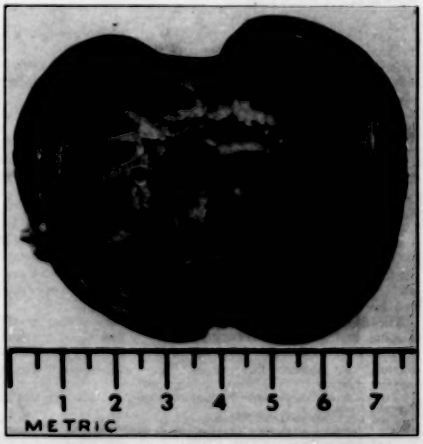

Fig. 3.—Sagittal sections of the hydronephrotic kidney in figure 2. There are multiple small hemorrhages in the pelvic mucosa. The papillary tips are gray and hemorrhagic. The relatively inconspicuous appearance of the severe lesion in this case can be readily appreciated.

affected areas impossible. When a sufficiently large amount of renal tissue is thus damaged, fatal renal insufficiency results. It is of interest that in 2 of our 3 cases the papillary necrosis was associated with a severe grade of hydronephrosis. Clinically the condition is usually characterized by a rapidly progressing uremia.

6. Rich, A.: A Peculiar Type of Adrenal Cortical Damage Associated with Acute Infections, and Its Possible Relation to Circulatory Collapse, Bull. Johns Hopkins Hosp. 74:1, 1944.

The diabetic patient appears to succumb to an overwhelming infection. A rapidly rising blood urea level in the presence of urinary tract infection with obstruction or the acute development of fulminating infection in the diabetic person should make one suspicious of the presence of the condition during life.

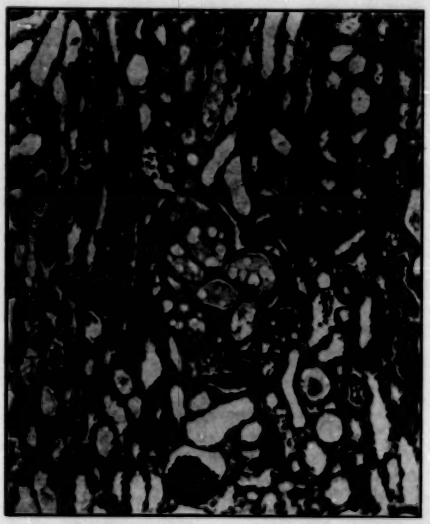

Fig. 4.—Corticomedullary area of hydronephrotic kidney in figure 2. A glomerulus is compressed and bloodless. The distal segments and collecting tubules are dilated and atrophic. Hyaline casts are prominent with atrophic tubules.

EXPERIMENTAL OBSERVATIONS

Twenty-eight healthy adult mongrel dogs were subjected either to unilateral ureteral ligation followed subsequently by contralateral nephrectomy or to bilateral ureteral ligation. Through a short midline incision anterior to the pubis the ureters were approached transperitoneally, freed from their accompanying blood vessels, ligated, and cut near their entrance into the bladder. The end of the ureter proximal to the bladder was buried in the adjacent soft tissues. The arterial blood pressure was obtained by direct puncture of the femoral artery and read on a mercury manometer.[7] The animals were placed on an "electrolyte-free" diet, and in vivo dialysis was conducted on 20 animals for periods of three to four hours every three to four days by the periodic application of an artificial kidney patterned after the Kolff [8] apparatus. The methods used for the blood studies and the technic of in vivo dialysis by the artificial kidney have been reported elsewhere.[9] Autopsies were performed shortly after death, and the tissues were prepared and stained with hematoxylin and eosin in the usual manner.

India Ink Injection Studies of the Renal Circulation.—In an attempt to demonstrate circulatory disturbances in a kidney with increased intrapelvic pressure, arterial injection studies with india ink were conducted. Kidneys from normal dogs were removed immediately after exsanguination. The renal arteries were cannulated and connected by a Y tube to a syringe with a side-arm connection to a mercury manometer. The ureter of one kidney was connected via a cannula to a saline reservoir suspended so as to give variable hydrostatic pressures. The renal vessels were cleared of blood by perfusion with isotonic sodium chloride solution, after which 20 cc. of an india ink suspension was injected under a controlled pressure. By this arrangement the distribution of india ink in the medullary blood vessels could be studied under conditions of variable vascular and pelvic pressures, one kidney acting as a control. Immediately after this procedure, the kidneys were sectioned sagittally, examined grossly, fixed in formaldehyde solution and subsequently studied microscopically.

Ten pairs of kidneys were injected and examined. Intrapelvic pressures varied between 32 and 44 mm. of mercury, and the pressures of the perfusing fluids were varied from 50 to over 200 mm. of mercury.

Results of Experimental Studies.—Renal lesions: Gross examination revealed no correlation between the survival of the animal and the extent of the renal lesions. The 8 animals not subjected to in vivo dialysis displayed the same lesions as the dialyzed animals. Distention of the ureter and pelvis occurred in every instance, varying from a moderate to a severe degree. Over half of the pelves contained a limpid or slightly turbid fluid; in 2 instances the pelvis was filled with blood; in the remainder it was distended with pus.

The capsular veins were decidedly engorged in all cases, and capsular hemorrhages were common. However, the parenchyma was pale (fig. 2). Parenchymal hemorrhages, 0.5 cm. in diameter, occurred in 4 instances. In 2 instances the kidney was enveloped by a hematoma which extended into the retroperitoneal tissues.

Fig. 5.—Hydropic degeneration of the proximal segments and dilatation and atrophy of the distal segments and collecting tubules are depicted in this photomicrograph (slightly reduced from a magnification of × 150).

The renal papillae (apexes of the renal pyramids) varied in appearance. Usually these structures were gray or gray and hemorrhagic (fig. 3). At other times, particularly when pyonephrosis existed, the papillae were grayish, ragged and covered by a shaggy exudate. The necrosis was grossly

7. Grollman, A.: Experimental Hypertension in the Dog, Am. J. Physiol. 147: 647, 1946.
8. Kolff, W. J., and Van Noordwijk, J.: The Artificial Kidney, J. H. Kok N. V. Kampen (Holland), 1946.
9. Vanatta, J.; Muirhead, E. E., and Grollman, A.: Improvement on the Artificial Kidney: An Experimental Study of Its Application to Dogs Bilaterally Nephrectomized or Otherwise Deprived of Renal Excretory Function, Am. J. Physiol. 156: 443, 1949.

confined to the tips of the papillae, but in structures with extensive pyelonephritis gray linear streaks of suppuration extended from the medulla into the cortex and punctate cortical abscesses were noted.

Microscopically, dilatation of all tubules with atrophy of the epithelial lining and some degree of compression of the parenchyma were noted. The dilatation was greatest in the collecting tubules and distal segments but not infrequently included the proximal segment. The glomeruli were compressed and for the most part bloodless. Granular debris and epithelial desquamation were noted in many tubules. Hyaline casts filled many tubules (fig. 4). Hydropic degeneration of the epithelium of the proximal segment was common. The cytoplasm of the affected cells was distended, with the intact nuclei standing out in relief (fig. 5). The capsular veins and lymphatic vessels showed extreme distention, and in some specimens interstitial hemorrhages had occurred. The peritubular capillaries were often inconspicuous. Cortical extension of pyelonephritis was as often absent as present.

Fig. 6.—The tip of a papilla from the hydronephrotic kidney of figure 2. There are coagulation necrosis of the pelvic lining and adjoining parenchyma and interstitial hemorrhage. A dilated, partly necrotic major collecting tubule is demonstrated (slightly reduced from a magnification of × 150).

The microscopic appearance of the papillae varied and presented two distinct pictures; (1) coagulation necrosis of the tips with varying degrees of interstitial hemorrhage (fig. 6) and (2) necrosis, hemorrhages and suppurative inflammation extending into the adjoining medullary areas. This suppuration was at times associated with extensive pyelonephritis, cortical abscesses and hyaline thrombi in the deep medullary blood vessels. The coagulation necrosis involved the collecting tubules near their contact with the pelvis. Bacterial masses were at times superimposed on the area of coagulation necrosis in the absence of suppuration. Another isolated observation was a fibrinous coating of the papillae. The accompanying table gives the incidence of the various lesions observed.

India Ink Perfusions: All the injected pairs of kidneys demonstrated a difference in the distribution of india ink within the parenchyma. In the controls (no intrapelvic pressure) the india ink penetrated throughout the entire depth of the medulla and cortex. One half of the kidneys subjected to an induced intrapelvic pressure (artificial hydronephrosis) showed an absence of ink in the inner portion of the medulla, particularly the tips of the papillae, while the cortex was well stained. The other half of the kidneys revealed a definite decrease of the ink content of the inner medullary zones as compared to the controls. Microscopic examination of these specimens indicated that the ink was confined to the lumens of the blood vessels.

COMMENT

Experimental ureteral obstruction was followed by hydronephrosis and necrosis of renal papillae in 18 of 28 animals. This necrosis, located as it is in a strategic portion of the kidney, gives rise to blockage of the ducts of Bellini as they approach the pelvis, with resultant necrosis of their lining cells. The tubules behind the block undergo dilatation and atrophy, the renal parenchyma becoming pale and relatively ischemic. The capsular blood vessels become engorged and may be the source of hemorrhages. The bloodless appearance of many glomeruli indicates that glomerular filtration is hampered. Where filtration does not stop altogether, the glomerular filtrate must be reabsorbed as indicated by the limitation of tubular distention. Reabsorption may occur via the tubules or by pyelovenous backflow, as emphasized by Hinman.[10] The renal tubules undergo degeneration and desquamation, with resultant renal insufficiency.

Incidence of Renal Changes in 28 Dogs Subjected to Ureteral Ligation

Lesion	Percentage
Generalized dilation of all tubules	50
Generalized dilation of collecting tubules and distal segments mainly	29
Compression of glomeruli	64
Hydropic degeneration of proximal segments of tubules	64
Desquamation of epithelium, granular debris and casts in tubules	32
Papillary changes	
Coagulation necrosis only	64
Papillary hemorrhage	60
Suppurative necrosis	29
Diffuse pyelonephritis	25

The renal parenchyma manifested several features characteristic of the acute tubular nephropathy which has been designated as hemoglobinuric or lower nephron nephrosis. Since the blockage of renal tubules is only partial in the latter condition, the resemblance cannot be ascribed to this feature alone and serves to emphasize again that tubular damage may have a varied etiologic background. The dilated tubules filled with casts observed in papillary necrosis resembled to a certain extent the so-called "thyroid kidney" of advanced pyelonephritic renal atrophy.

The experiments with india ink perfusion demonstrated poor filling of the medullary blood vessels in the presence of increased intrapelvic pressure (artificial hydronephrosis). The blood vessels near the tips of the papillae were particularly susceptible to this procedure. Hinman [11] has shown that the pressure in the dog's ureter rises to 60 to 70 mm. of mercury after acute mechanical obstruction and is maintained at this level for several hours. Subsequently, the pressure drops to low levels. McDonald, Mann and Priestley [12]

10. Hinman, F.: Hydronephrosis, Surgery **17**: 816, 836 and 845, 1945.
11. Hinman, F., and Lee-Brown, R. K.: Pyelovenous Backflow, J. A. M. A. **82**: 607 (Feb. 23) 1924.
12. McDonald, J. R.; Mann, F. C., and Priestley, J. T.: The Maximal Intrapelvic Pressure (Secretion Pressure) of the Kidney of the Dog, J. Urol. **37**: 326, 1937.

observed even higher pressures in the unanesthetized dog after acute obstruction. The pressures in our experiments were therefore well within the limits of those occurring in the intact animal. Since these pressures are capable of preventing the filling of the medullary vessels, it may be assumed that during life ischemia of the renal papillae may occur under conditions of acute ureteral obstruction with hydronephrosis.

Further evidence of papillary ischemia is revealed by the type of necrosis occurring after complete ureteral obstruction. The necrosis was of the coagulation type and was associated with hemorrhages in 60 per cent of the cases. These two changes are indicative of infarction of the papillae.

Trueta and his co-workers[13] have described the course of the blood vessels through the kidney. According to these workers the medullary vessels arise as a continuation of the efferent vessels from the juxtamedullary glomeruli, travel downward into the medulla in bundles and loop back into the venous arcade without the intermediation of capillaries, thus forming arteriovenous shunts. Less conspicuous side-branches act as nutritive channels. Two anatomic features in the medulla would seem to make the vessels here susceptible to occlusion by pressure: First, this zone has a greater amount of loose interstitial tissue and therefore should be more compressible than the densely packed cortex; second, the U-shaped course of the shunt vessels should make the lower transverse segment (bottom of U) more susceptible to occlusion, as the pressure here would be perpendicular to the axis of the vessel. Anatomically, therefore, it is to be expected that intrapelvic pressure accounts for the ischemia which ultimately causes papillary necrosis.

The papillary necrosis occurring in diabetic persons is of the coagulation-suppurative type and resembles that occurring in obstructive uropathy with pyelonephritis. The pathogenesis of the latter seems established as depending primarily on pressure ischemia. Since in the diabetic urinary tract obstruction has not been observed in association with papillary necrosis the source of the ischemia must be sought elsewhere. Thrombosis is improbable because of its infrequency. It would appear most likely that in the diabetic patient the pyelonephritis is primary and the papillary necrosis results from pressure, caused by interstitial inflammation. The experimental evidence indicates that the converse occurs in the obstructive uropathies of nondiabetic persons: namely, that the ischemic necrosis occurs first and that pyelonephritis is a secondary complication.

The effect of this obstructive uropathy on the blood pressure has been described elsewhere.[14] Ligation of one or both ureters results in a temporary elevation of the blood pressure, which reaches a maximum two to four days after the operation and subsides to the normal level in the course of a week to ten days. The normal pressure observed in case 1 of our series, despite an extreme grade of excretory renal insufficiency, is in keeping with these blood pressure data.

13. Trueta, J.; Barclay, A. E.; Daniel, P. M.; Franklin, K. J., and Prichard, M. L.: Studies of the Renal Circulation, Springfield, Ill., Charles C Thomas, Publisher, 1947.

14. Grollman, A.; Vanatta, J., and Muirhead, E. E.: The Role of the Kidney in the Pathogenesis of Hypertension as Determined by a Study of the Effects of Bilateral Nephrectomy and Other Experimental Procedures on the Blood Presure of the Dog, Am. J. Physiol. 157: 21, 1949.

Papillary necrosis of the kidney is an important clinical entity. In patients with bilateral involvement it usually gives rise to a rapidly fatal renal insufficiency, but in those with unilateral necrosis the condition is amenable to surgical treatment. Its occurrence should always be considered in the differential diagnosis of acute renal insufficiency.

After relief of an acute obstruction of the urinary tract a period of depressed renal function may occur as a result of the tubular degeneration. The recovery of such kidneys should mimic the recovery in other types of acute tubular nephropathies.[15] The recent report of Warren and Looney[16] supports this view.

SUMMARY AND CONCLUSION

1. The clinicopathologic observations in 3 patients with papillary necrosis of the kidney have been reported.

2. An experimental study of the pathogenesis of this disorder has been made on the basis of observations of the condition in 28 dogs subjected to ureteral ligation.

3. Studies have also been made of the effect of increased intrapelvic pressure on the vascularization of the isolated perfused kidney.

4. The results of this study indicate that papillary necrosis of the kidney in acute obstruction of the urinary tract is due to ischemia resulting from the application of pressure to a morphologically vulnerable zone.

5. The occurrence of pyelonephritis in cases of papillary necrosis in obstructive uropathies is considered to be secondary to the necrosis induced by the obstruction. However, in the papillary necrosis observed in diabetic persons the infection appears to be primary, the interstitial inflammation resulting in the papillary necrosis.

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LEUKOPLAKIA OF THE RENAL PELVIS

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Leukoplakia of the renal pelvis may be defined as the formation of pearly, opaque, firm plaques on the mucous membrane of that organ. The condition may be further defined as a metaplastic alteration of the cells lining that organ to cells of another type. Leukoplakia of the renal pelvis is a paradox. It simulates an epithelial process but occurs on a mucous membrane. Pathologically leukoplakia of the renal pelvis is of interest because of its uncertain causation and termination; clinically it is important because of its diagnosis and treatment.

Leukoplakia occurs on other mucous membranes of the body more frequently than it does in the renal pelvis. However, its occurrence in the renal pelvis may be considered uncommon but not rare. Rokitansky[1] in 1861

15. Muirhead, E. E.; Vanatta, J., and Grollman, A.: A Comparison of the Use of an Artificial Kidney, Peritoneal Lavage and More Conservative Measures in the Management of Acute Renal Insufficiency, Arch. Int. Med. 83: 528 (May) 1949.

16. Warren, G. J., and Looney, J. M.: Partial Ureteral Obstruction, New England J. Med. 240: 413, 1949.

Read before the Section on Urology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

1. Rokitansky, C. F., von.: Lehrbuch der pathologischen Anatomie, ed. 6, Vienna, W. Braumüller, 1861, vol. 3, p. 354.

first described leukoplakia of the bladder. It was not until 1882, twenty-one years later, that Ebstein first described leukoplakia of the renal pelvis. In a survey of the records at Philadelphia General Hospital from 1936 to 1948, inclusive, it was found that not a single case was observed in 46,928 autopsies.[2] Nor was such a diagnosis made in any instance in the 251,578 persons discharged from the hospital during the same years. Such statistics tend to prove that the condition is uncommon, although Patch [3] in an analysis of 152 cases of leukoplakia of the urinary tract found that the bladder was involved 110 times, the renal pelvis 36 times and the ureter only 6 times. It is not believed that the sparsity of reported cases of leukoplakia of the renal pelvis is a true index of the number of cases occurring since the first reported case in 1882. This is perhaps due to the difficulty of diagnosis of this condition, the

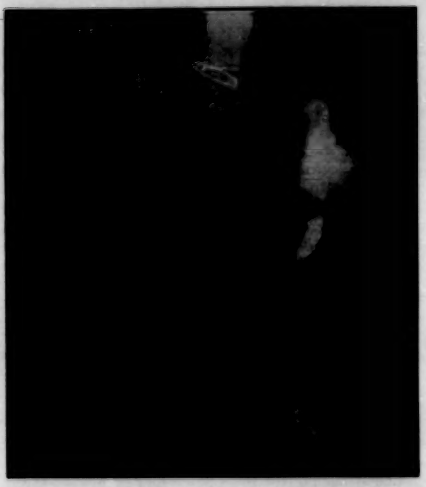

Fig. 1.—Retrograde pyelogram. The proximal portion of the ureter, pelvis and calices may be seen to be dilated. There is a well defined stenosis or stricture about 1 cm. in length at the left pelvoureteral junction.

relative infrequency of its occurrence and the inability to obtain routine autopsies which will disclose additional instances of it.

Leukoplakia occurs only as a pathologic process. Grossly, the pathologic appearance of leukoplakia is evident when keratinization has progressed to the formation of pearly, opaque, firm plaques. Histologically, leukoplakia is evident when the normal transitional epithelium undergoes a change to stratified squamous epithelium with keratinization. Rickey [4] stated that "while tissues of mesoblastic origin lend themselves more readily to metaplastic transformation than those of epiblastic or hypoblastic origin, nevertheless, innumerable examples have been encountered where structures which are normally of the stratified squamous, transitional, cuboidal or columnar type have assumed characteristics of keratinizing stratified squamous epithelium." This metaplastic change through the stage of keratinization does occur in the mucous membrane of the portions of the urinary tract, the renal pelvis, ureter, bladder and portions of the urethra, where squamous epithelium is not normally present. The factors underlying or producing such metaplastic change are not understood, as the etiologic basis of leukoplakia is not known. Several theories have been advanced, but none can fully explain the occurrence of the condition. To substantiate this Ash and Friedman,[5] in discussing leukoplakia of the renal pelvis, stated: "Epithelial metaplasia is encountered under a variety of circumstances, for example, in chronic inflammatory processes, in ischemic lesions and in vitamin A deficiency." Chronic inflammation is the most frequently considered cause of leukoplakia of the renal pelvis. Chronic irritation, chemical stimuli, vitamin A deficiency, syphilis and congenital cell rests have been advanced as possible etiologic factors. The idiopathic origin has also been considered by some investigators. It is believed that syphilis is an incidental observation and that it is not an etiologic factor. Wells [6] considered that metaplasia may be interpreted as a chemical alteration due to mechanical stimuli, there being a production of keratin by cells which ordinarily do not produce or form it. Chronic irritation resulting from calculi has been also considered. However, calculi have not been demonstrated in every instance of leukoplakia of the renal pelvis. The congenital origin of leukoplakia is considered to be an etiologic factor by some observers. The congenital theory is supported by the case reported by Leber. This case was observed in a female infant 4 months of age with leukoplakia of the renal pelvis and xanthoma of the conjunctivas. Likewise, the idiopathic origin of leukoplakia must be considered. Numerous examples of leukoplakia have been demonstrated without any evidence of the presence of the considered etiologic factors. Chronic inflammation does present a possible etiologic factor and is demonstrated by the case to be reported herewith. The majority of the cases of leukoplakia of the renal pelvis reported in the literature also present histories of long-protracted infections of the upper part of the urinary tract. The repeated insults to the tissues over extended periods by exacerbations, followed by low grade, continued infection, most probably induce this type of metaplasia. Kretschmer [7] in a survey of 13 cases of leukoplakia was unable to demonstrate any pathologic condition other than infection in the urinary tract. The role of vitamin deficiency as a factor causing leukoplakia is not known. Ash and Friedman consider such deficiency a possibility. Wolbach also noted abnormal tissue reactions in vitamin deficiency. He observed extensively distributed epithelial metaplasia in the conjunctivas, ocular glands, alimentary tract, respiratory tract and genitourinary tract. The epithelium was replaced by stratified keratinizing epithelium, strongly resembling leukoplakia.

2. McCrea, L. E.: Clinical Cystoscopy, Philadelphia, F. A. Davis Company, 1949.

3. Patch, F. S.: The Association Between Leucoplakia and Squamous Cell Carcinoma in the Upper Urinary Tract, New England J. Med. 200: 423, 1929.

4. Rickey, De. W. G.: Leukoplakia of the Pelvis of the Kidney: A Study in Metaplasia, J. Lab. & Clin. Med. 5: 635, 1920.

5. Ash, J. E., and Friedman, N.: Leukoplakia of Renal Pelvis, Atlas of Genito-Urinary Pathology, 1946.

6. Wells, H. G.: Chemical Pathology, Philadelphia, W. B. Saunders Company, 1918, p. 1285.

7. Kretschmer, H. L.: Leukoplakia of the Kidney Pelvis, Arch. Surg. 5: 348, 1912.

It is altogether possible that avitaminosis or possibly vitamin A deficiency plays a role in these cases of leukoplakia.

From this series of conflicting statements and theories it may be seen that the cause of leukoplakia is not known. The condition is an important entity for clinical study because of its insidious occurrence and its considered precancerous tendencies.

Boyd [8] has summarized knowledge of the condition by stating, "Leukoplakia is a rare accompaniment of chronic inflammation. It may be confined to the renal pelvis or bladder or it may involve the pelvis, ureter or bladder. The mucosa is pale and wrinkled so as to resemble skin, and the change is usually patchy with rather clear-cut areas. It is an epidermoid change, a metaplasia of the transitional type of epithelium to a squamous stratified type. Both in the renal pelvis and in the calyces it may be a precursor of the nonpapillary type of carcinoma, so that it may be regarded as a precancerous condition."

It may be that the occurrence of squamous cell carcinoma in organs which normally do not contain this type of epithelium may be explained on a basis of metaplasia. The normal epithelium of these organs is converted into stratified squamous epithelium with the ultimate formation of leukoplakia. It is possible that subsequent squamous cell carcinoma occurs as the ultimate tissue reactions.

REPORT OF CASE

M. B., a white woman aged 53, was originally seen because of pyuria. She had had intermittent pain in the left loin associated with attacks of chills and fever for more than twenty years. Urinalysis revealed innumerable pus cells. Urine culture yielded Escherichia coli. An intravenous urogram revealed a functionless left kidney. Retrograde pyelography demonstrated a pyonephrosis of moderate extent (fig. 1). Nephrectomy was performed. The diagnosis was leukoplakia of the renal pelvis.

Grossly, the kidney removed at operation measured 9 by 4 by 2 cm. The exposed cortical surface was coarsely granular and lobulated. Numerous depressed and scarred areas studded the surface. A hilar section revealed a greatly dilated pelvis and enlarged calices which had encroached on renal parenchyma. The appearance of the pelvic mucosa was most unusual. Fully two thirds of the lining had a thickened, crinkled, bluish gray, silvery appearance. The remaining portion was pale and smooth. Flakes of soft grayish material were on the surface of the mucosa.

Microscopically, sections of the thickened pelvic wall showed an extraordinary squamous metaplasia with prominent keratinization (fig. 2). The epithelium was arranged in an irregular polypoid fashion. Beneath, the immediate subepithelial layer was edematous and degenerated. Inflammatory cells were scattered throughout. Sections of the renal parenchyma displayed the inflammatory features and scarring of chronic pyelonephritis. Here and there some calcification was seen.

SYMPTOMS, DIAGNOSIS AND TREATMENT

There are no classic or specific symptoms of leukoplakia of the renal pelvis. The symptoms portrayed are those of coexisting or associated conditions. It is usual that the symptoms are those of long-continued urinary tract infection. It is usual that a history of frequent exacerbations of pain in the loin, chills and fever and increased pyuria is elicited. It is not uncommon that dysuria, frequency and urgency with burning on urination are constant factors.

8. Boyd, W.: Textbook of Pathology, ed. 3, Philadelphia, Lea & Febiger, 1940, p. 681.

The diagnosis of leukoplakia of the renal pelvis is seldom made preoperatively. The observation of cornified squamous epithelial plaques in the urine is considered pathognomonic evidence of the presence of the condition.

The treatment of leukoplakia of the renal pelvis is never conservative if the condition is unilateral. Nephrectomy is the only treatment, particularly if the associated condition has caused widespread destruction of the kidney. The possibility of the presence of leukoplakia should always be considered in every instance of long-continued urinary tract infection associated with frequent exacerbations. Further, the inherent tendency of leukoplakia to undergo malignant change should always be considered, and measures should be instituted before such change occurs.

Fig. 2.—Photomicrograph showing leukoplakia of the renal pelvis. The normal mucosa is replaced by a layer of squamous epithelium covered by a dense mass of keratin.

SUMMARY

Leukoplakia implies the formation of pearly, opaque, firm plaques on a mucous membrane. The condition occurs in the renal pelvis. Its occurrence, although not rare, is infrequent. Leukoplakia of the renal pelvis is of importance because of its uncertain etiologic basis, the difficulties of its preoperative diagnosis and its apparent tendency to malignant change. Palliative or conservative methods of treatment should not be considered because of the inherent tendency of leukoplakia to undergo malignant change.

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ELECTROLYTE PATTERN OF THE BLOOD AFTER BILATERAL URETEROSIGMOIDOSTOMY

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A year and a half ago Marshall,[1] in discussing transplantation of the ureters and total cystectomy, wrote as follows, "If the ureters are transplanted to the bowel above a normal anal sphincter the patient does not need apparatus, is socially acceptable, and except for the necessity of sitting to urinate, which half the population does naturally, appears outwardly normal. However, the problem is not simple because the immediate and late risks of uretero-intestinal anastomosis are not only greater but are usually of more grave importance than after skin transplantation." The very normalcy which such patients enjoy, however, may in a sense be responsible for one of the serious complications of the procedure.

We wish to report at this time briefly on some of our experiences with a group of such patients. About four years ago one of us (D. O. F.) observed that after both ureters have been transplanted into the wall of the sigmoid colon an alkali deficit appears to develop in some patients, but this phenomenon does not seem to occur if only one ureter is transplanted. It further was noticed that when the apparent alkali deficit develops in the period immediately after operation such patients are prone to experience an uncomfortable and stormy convalescence. In other patients the condition does not develop for weeks or months after operation.

TABLE 1.—*Postoperative Chemical Composition of the Blood of a Woman Aged 37* *

Date	Urea, Mg. per 100 Cc. of Blood	Milliequivalents per Liter of Plasma: Chloride	Milliequivalents per Liter of Plasma: Bicarbonate
Normal values	40 or less	103	27
2/25/47	22	103	22
2/26/47	22	99	27
2/27/47	24	105	30
2/28/47	16	108	28
3/ 1/47	22	106	26
3/ 3/47	21	102	22
3/ 4/47	19	103	28
3/ 5/47	14	103	27
3/ 6/47	12	105	28
3/11/47	22	106	25
3/18/47	24	110	22

* Bilateral ureterosigmoidostomy (case 1) was performed Feb. 24, 1947.

The magnitude of the defect in the electrolyte pattern of the blood in some patients, with associated clinical symptoms in varying degrees of severity, has prompted us to investigate the problem further in an attempt to determine the nature and mechanism of production of the electrolyte disturbance and to work out as simple and as rational a method of combating such a defect as possible. In the following report we wish to present a few of our experiences with such cases, a description of the defect of the blood electrolyte pattern involved, a brief discussion of possible mechanisms responsible, and an outline of a therapeutic program which we have found to be successful in correcting the electrolyte defect, with consequent alleviation of the patient's symptoms.

The literature of the past fifty years contains many excellent reports dealing with various urologic and surgical aspects of ureterointestinal anastomosis; however, although alterations in the electrolyte pattern of the blood undoubtedly have previously been observed, little reference has been made to them.

NATURE OF THE DEFECT

Varying amounts of acid and basic ions are continually being poured into the blood by the type of food ingested, muscular exercise and so forth. However, the anions and cations comprising the electrolyte content of the blood are so balanced as to insure that decided changes in the acid-base balance do not occur. Without entering into a detailed discussion of the various buffer systems in the blood and of acidosis and alkalosis, it is enough to say that if there is a relative deficiency of chloride in the plasma or extracellular fluid, plasma bicarbonate levels usually become high and alkalosis results. If there is a relative deficiency of sodium, bicarbonate in plasma has a low concentration and acidosis develops. In some conditions acidosis may be explained by accumulation of abnormal acids, such as aceto-acetic acid in diabetic acidosis, but in general acidosis may be explained by a relative or absolute deficiency of sodium.

The pattern of the electrolyte disturbance occurring in patients after bilateral ureterosigmoidostomy can best be appreciated by examining the bar diagrams of 2 typical cases.

CASE 1.—A woman aged 37 underwent one stage bilateral ureterosigmoidostomy because of interstitial cystitis on Feb. 24, 1947; she had an uneventful convalescence and was dismissed thirty-three days later (table 1). She returned to the clinic July 17, 1947, complaining that she had been ill since shortly after she had returned home in March with anorexia, nausea, vomiting, diarrhea and loss of weight of 25 pounds (about 11 Kg.) (table 2). Her blood electrolyte pattern, determined July 18, is shown in the form of a bar diagram in figure 1. These values make it immediately apparent that the patient had an absolute hyperchloremia and a deficit of bicarbonate.

CASE 2.—A man aged 45 underwent one stage bilateral ureterosigmoidostomy on March 4, 1947, because of a vesical carcinoma. His postoperative convalescence was uneventful, and he was dismissed twenty-four days after operation (table 3). Four months later, on July 17, 1947, the patient returned to the clinic complaining of nausea, vomiting and diarrhea of three months' duration (table 4). Determination of the chemical constituents of his blood on July 18 revealed an electrolyte pattern almost identical with that found in case 1 (fig. 2).

We have found the same characteristic aberration in the electrolyte pattern to occur in all cases in our series in which there was a deviation from normal, and such a disturbance may properly be termed "hyperchloremic acidosis." In normal plasma the ratio of sodium to chloride is 1.4:1. Although in the cases under discussion the absolute values for sodium in the serum are essentially normal, increased values for plasma chloride result in a decided reduction of the sodium to chloride ratio (relative sodium deficit or chloride excess).

In addition to the observed alterations in the blood electrolytes there should be mentioned the moderate elevation of values of urea (figs. 3 and 4) and sulfate

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This paper has been abbreviated on account of lack of space. The complete paper can be found in the authors' reprints.

Read before the Section on Urology at the Ninety-Eighth Annual Session of the American Medical Association, Atlantic City, N. J., June 8, 1949.

1. Marshall, V. F.: Transplantation of the Ureters and Total Cystectomy, J. Urol. 58:244-249 (Oct.) 1947.

in the blood and the normal or near normal values for creatinine (tables 2 and 4). Such changes have likewise been observed to occur in the majority of patients in whom hyperchloremic acidosis has developed after bilateral transplantation of the ureters into the sigmoid or rectum.

MECHANISM

The mechanism by which such an acidosis develops in patients after bilateral ureterosigmoidostomy still is not clear. However, the following observations in our opinion may offer an explanation for the phenomenon. In case 1 the patient was hospitalized on July 24, 1947 and was placed on a normal diet without restriction of salt. On the same day a biluminal rectal tube was inserted, and for five days she received continuous lavage of the lower part of the sigmoid and the rectum with tap water for the purpose of eliminating urine excreted as soon as it entered the rectum. At the end of this five day period the acidosis had definitely improved (table 2).

On the basis of this simple experiment, we consider it probable that the disturbance in electrolyte balance may develop as a result of absorption across the rectal

TABLE 2.—*Later Chemical Composition of the Blood of the Patient in Table 1* *

	Mg. per 100 Cc. of Blood		Milliequivalents per Liter of Plasma			
Date	Urea	Creatinine	Sulfate	Chloride	Bicarbonate	Sodium
Normal values	40 or less	2 or less	1.0	103	27	142
7/10/47	70	...	...	119	13	...
7/14/47	70	...	1.3	112	15	138
7/18/47	..	...	...	117	19	143
7/21/47	45	1.3	1.3	114	23	141
7/25/47	38	...	...	109	26	144
7/29/47	34	...	0.7	110	27	144
8/ 4/47	51	...	0.8	92	37	137
8/ 5/47	66	...	...	98	28	...
8/ 6/47	66	...	...	98	28	...
8/ 9/47	24	...	...	106	19	...
8/11/47	32	...	1.0	106	21	138
8/18/47	74	...	1.3	111	19	140

* Continuous rectal lavage (tap water) was maintained in case 1 from July 24 to 29, 1947. The 0.5 Gm. sodium diet with 4 drachms (16 Gm.) of sodium bicarbonate daily was prescribed from July 29 to Aug. 4, when the sodium bicarbonate was discontinued because of alkalosis. The patient had acute pyelonephritis from August 6 to 10. The low chloride diet (1.6 Gm. sodium and 2.2 Gm. chloride) plus 20 grains (1.29 Gm.) of sodium bicarbonate three times a day was prescribed August 11.

mucosa of chloride from secreted urine held in the rectum and sigmoid. Basic physiologic studies over a period of years have shown that one of the major functions of the colon is absorption of water and other constituents of bowel contents.[6] That chloride can be absorbed across the wall of the rectum and sigmoid has been amply demonstrated.[7] Practical examples of this may be found in the absorption of water and electrolytes given by proctoclysis. A further illustration is the case, reported in detail elsewhere, of a young man suffering from terminal chronic glomerulonephritis with advanced renal insufficiency.[8] At one stage in his hospital course it was decided to attempt lavage of the colon in an attempt to relieve the azotemia and uremia. Accordingly, the appendix was exteriorized with the patient under local anesthesia and a 16 F rubber catheter was inserted through the appendical stoma into the cecum to serve as an inflow tube. A 48 F rectal tube was inserted into the rectum for recovery of the perfusing fluid. Lavage of the colon was continued over a three day period, Power's* solution being used as the perfusate. During the period of lavage the patient's diet consisted only of fruit juice and other salt-free fluids. On the second day of lavage the value for chloride in the plasma soared to high levels,

TABLE 3.—*Postoperative Chemical Composition of the Blood of a Man Aged 45* *

	Urea, Mg. per 100 Cc. of Blood	Milliequivalents per Liter of Plasma	
Date		Chloride	Bicarbonate
Normal values	40 or less	103	27
3/ 6/47	30	107	22
3/ 7/47	34	99	30
3/ 8/47	44	93	34
3/10/47	70	95	26
3/11/47	78	95	24
3/12/47	62	99	24
3/13/47	46	100	23
3/14/47	38	100	25
3/15/47	32	106	24
3/17/47	32	96	24
3/19/47	32	95	26
3/22/47	32	104	23
3/25/47	32	104	23
4/ 1/47	30	100	19

* Bilateral ureterosigmoidostomy (case 2) was performed March 4, 1947. Rectal incontinence continued until March 25. The patient was given 0.9 per cent sodium chloride solution intravenously March 4, 5, 6, 7 and 9.

TABLE 4.—*Later Chemical Composition of the Blood of the Patient in Table 3* *

	Mg. per 100 Cc. of Blood		Milliequivalents per Liter of Plasma			
Date	Urea	Creatinine	Sulfate	Chloride	Bicarbonate	Sodium
Normal values	40 or less	2 or less	1.0	103	27	142
7/30/47	60	...	...	106	14	...
7/14/47	60	...	...	113	13	137
7/18/47	..	1.7	1.7	116	19	139
10/15/47	64	...	1.1	104	28	142
2/26/48	58	...	...	103	29	135
2/ 2/48	56	...	...	101	28	...

* In case 2 the 0.5 Gm. sodium diet was prescribed July 19, 1947 plus 20 grains (1.29 Gm.) of sodium bicarbonate three times a day. There was an 18 pound (about 8 Kg.) weight gain between July and October, 1947. The low chloride diet (1.6 Gm. sodium and 2.2 Gm. chloride) plus 20 grains of sodium bicarbonate three times a day was prescribed Feb. 26, 1948.

with a fall in the carbon dioxide-combining power of the plasma. Associated with this were a noticeable rise in the concentration of chloride excreted in the urine and a distinct increase in the volume of urine excreted (chloride diuresis) (fig. 5).

Another possible explanation for the development of hyperchloremic acidosis in this group of patients has been suggested. Since in such patients recurrent

6. Goldschmidt, S., and Dayton, A. B.: Studies in the Mechanism of Absorption from the Intestine: I. The Colon: A Contribution to the One-Sided Permeability of the Intestinal Wall to Chlorides, Am. J. Physiol. 48:419-432; II. The Colon: On the Passage of Fluid in Two Directions Through the Intestinal Wall, ibid. 433-439; III. The Colon: The Osmotic Pressure Equilibrium Between the Intestinal Contents and the Blood, ibid. 440-449; IV. The Colon: The Behavior of Sodium and Magnesium Sulphate Solutions, ibid. 450-458; V. The Colon: The Effect of Sodium Sulphate upon the Absorption of Sodium Chloride When the Salts Are Introduced Simultaneously into the Intestine, ibid. 459-472; VI. The Colon: The Influence of Calcium Salts upon the Absorption of Sodium Chloride in the Intestine, ibid. 473-480 (May) 1919.

7. Goldschmidt, S.: On the Mechanism of Absorption from the Intestine, Physiol. Rev. 1:421-453 (July) 1921.

8. Daugherty, G. W.; Odel, H. M., and Ferris, D. O.: Continuous Lavage of the Colon as a Means of Treating Renal Insufficiency: Report of Case, Proc. Staff Meet., Mayo Clin. 23:209-214 (April 28) 1948.

9. Odel, H. M.; Ferris, D. O., and Power, M. H.: Clinical Considerations of the Problem of Extrarenal Excretion: Peritoneal Lavage, M. Clin. North America 32:1069-1076 (July) 1948.

episodes of ascending urinary tract infection are likely to develop, with some degree of renal parenchymal damage, the presence of excessive amounts of chloride in the blood may be due to inability of the kidneys to excrete chloride in a normal fashion. We accept this suggestion as a possible factor in some cases, particularly in the presence of other manifestations of organic renal parenchymal damage. However, the rapidity with which acidosis was corrected in case 1 through the simple medium of tapwater rectal lavage would indicate reabsorption of chloride as the major factor. In case 2 the patient, who underwent operation on March 4, 1947, experienced rectal incontinence until March 25, during which period the electrolyte pattern of his blood remained within normal limits. On March 25 he was able to exert adequate rectal sphincteral control for the first time, and seven days later mild but significant hyperchloremic acidosis had developed (table 3).

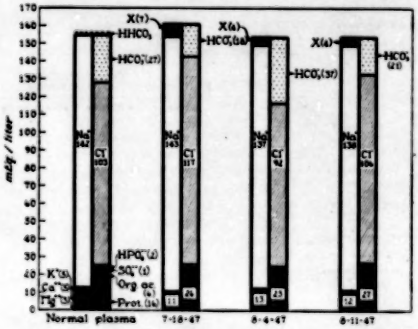

Fig. 1 (case 1).—Changes in electrolyte pattern in a patient who had undergone bilateral ureterosigmoidostomy three months previously. X denotes milliequivalents of unidentified cations.

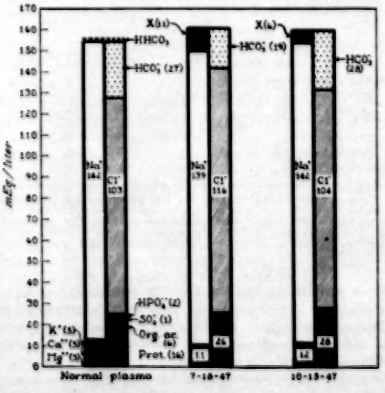

Fig. 2 (case 2).—Changes in electrolyte pattern in another patient who had undergone bilateral ureterosigmoidostomy three months previously. X denotes milliequivalents of unidentified cations.

Further substantiation for the hypothesis of chloride absorption may be had from the following experience.

Case 3.—A man aged 25 registered at the clinic Sept. 11, 1948 with severe hyperchloremic acidosis and bilateral renal calculi. He had undergone bilateral ureterosigmoidostomy for exstrophy of the bladder nine years previously at the age of 16 years (table 5). After correction of his acidosis, right nephrolithotomy was performed Oct. 19, 1948, after which a nephrostomy tube was left in place for ten days. During this period the patient was placed on a normal diet without sodium chloride restriction, and all urine from the nephrostomy tube was saved for determination of chloride. Chloride concentration in this urine, as shown in table 6, would indicate normal excretory ability for chloride from the right kidney nine years after bilateral ureterosigmoidostomy.

In the majority of cases of chronic hyperchloremic acidosis following bilateral ureterosigmoidostomy which we have had the opportunity to study thoroughly, it has not been unusual to find that values for urea in the blood and sulfate in the serum were elevated above normal. Such evidence of apparent renal impairment may be explained in one of several ways. In patients who have undergone bilateral transplantation of the ureters into the sigmoid or rectum, recurrent episodes of acute pyelitis or pyelonephritis are not uncommon. Over a period of several months or years, one might expect some degree of chronic renal parenchymal damage with consequent impairment of excretory function, especially in respect to the excretion of nitrogenous metabolites and sulfates. Furthermore, it has been a common clinical observation that latent or mild renal insufficiency may be intensified and made worse by the presence of either acidosis or alkalosis. A large volume of physiologic and biochemical investigation in the past has conclusively demonstrated that absorption, probably of a highly selective nature, is one of the major functions of the colon.[10] If, as we have reason to believe, chloride from secreted urine is reabsorbed across the wall of the lower part of the sigmoid and the rectum, it seems probable that urea, sulfates and other metabolites may likewise be reabsorbed. This supposition is strengthened by our observation in case 1 that after a period of five days of

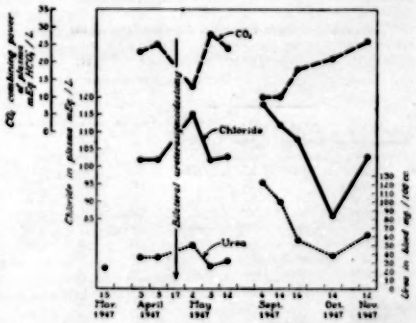

Fig. 3.—Chemical composition of the blood of a patient in whom hyperchloremic acidosis developed after bilateral ureterosigmoidostomy. Note elevated values for urea during period of acidosis and decrease in urea level after correction of the electrolyte imbalance.

10. Goldschmidt and Dayton.[9] Goldschmidt.[7]

continuous rectal lavage with tap water, not only did the plasma chloride level return to normal with a rise of the carbon dioxide-combining power to normal levels, but also the values for urea in the blood and sulfates in the serum returned to normal (table 2). If azotemia were due entirely to renal insufficiency on the basis of progressive renal damage, one might expect progressive elevation in creatinine levels in the blood in the presence of mild to moderate azotemia. Yet

TABLE 5.—*Chemical Composition of the Blood of a Man Aged 25 at the First Observation**

Date	Mg. per 100 Cc. of Blood		Milliequivalents per Liter of Plasma		
	Urea	Creatinine	Chloride	Bicarbonate	Sodium
Normal values	40 or less	2 or less	103	27	142
3/20/39	66	...	114	19	...
9/11/48	102	2.7	121	13	139
9/20/48	104	2.8	109	20	143
9/24/48	110	2.8	107	18	141
10/ 2/48	74	2.4	107	27	123
10/ 8/48	66	...	102	29	139
10/20/48	116	2.4	116	20	...
10/21/48	126	3.0	106	21	...
10/23/48	96	2.6	99	23	...
10/25/48	96	2.7	98	21	...
10/27/48	90	1.4	100	26	...
10/30/48	56	...	109	24	...
11/ 2/48	72	...	102	28	...
11/ 8/48	72	2.8	96	32	...

* Bilateral ureterosigmoidostomy (case 3) was performed March 27, 1939. To correct hyperchloremic acidosis the 0.5 Gm. sodium diet plus 30 grains (1.99 Gm.) of sodium bicarbonate three times a day was prescribed Sept. 14, 1948. After a right nephrostomy on October 19 the patient remained on a normal diet until October 20, when he was put on the low chloride diet (1.6 Gm. sodium and 2.3 Gm. chloride) plus 30 grains of sodium bicarbonate three times a day.

in the majority of cases, creatinine levels have been normal or nearly so. This is in accord with the observations of Bollman and Mann,[11] who did not note elevation in levels of creatinine in the blood in the presence of severe azotemia in animals that had had their ureters

TABLE 6.—*Chloride in Urine Recovered from Right Nephrostomy of the Patient in Table 5 (Case 3)*

Date	Volume, Cc.	Chloride in Urine	
		Total Mg.	Mg. per 100 Cc.
Normal values	..	...	600 to 700
10/22/48	56	430	770
10/23/48	210	630	900
10/25/48	225	420	950
10/26/48	178	430	760
10/27/48	67	470	700
10/28/48	57	460	780
10/29/48	70	500	550
10/30/48	64	540	550
11/ 1/48	115	440	510
11/ 2/48	100	420	420

transplanted into the lower part of the intestinal tract. In those cases in which creatinine levels were elevated significantly, high values for urea and other signs of advancing renal insufficiency and uremia have been found. Further support to the supposition that elevated levels for urea in the blood occur on the basis of reabsorption rather than renal parenchymal damage is the almost invariable satisfactory concentration of sodium iodomethamate (neo-iopax®) in the renal pelves of such patients, as manifested by excretory urography.

If, as we have assumed, hyperchloremic acidosis occurs as a result of absorption of chloride from urine stored in the rectum and sigmoid, one might logically expect either elevation of levels for sodium in the

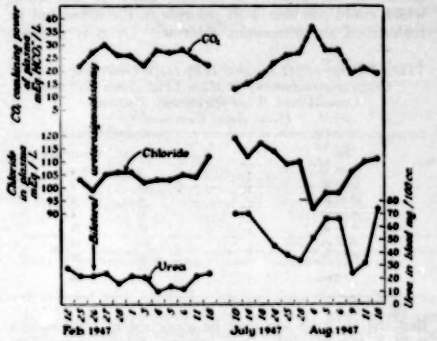

Fig. 4. (case 1).—Chemical composition of the blood.

serum or expansion of the extracellular compartment with some degree of clinical edema if all the chloride absorbed were absorbed as sodium chloride. As a matter of fact, in none of our cases has there been evidence of clinical edema, nor have we observed values for sodium in the serum which were not within normal limits (tables 2 and 4). Undoubtedly, some of the chloride absorbed is absorbed as sodium chloride, for absorption of sodium up to a certain point can be accommodated by expansion of the extracellular com-

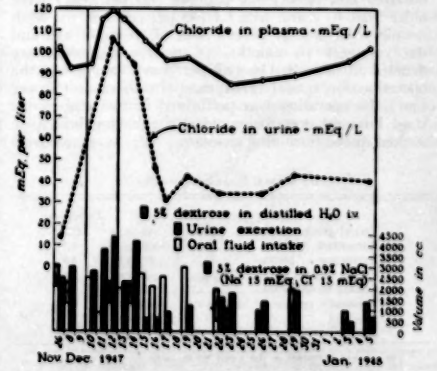

Fig. 5.—Concentration of chloride in plasma and urine during continuous rectal lavage with Power's solution.* Note increase of values for plasma chloride, of concentration of chloride in the urine and of urinary output during period of lavage. The diet from Nov. 26 to Dec. 7, 1947 contained 0.6 Gm. (26 milliequivalents) sodium and 0.9 Gm. (26 milliequivalents) chloride daily; from December 8 to 12 a salt-free liquid diet with the dialysate 3,461 milliequivalents of sodium and 2,636 milliequivalents of chloride; from Dec. 9, 1947 to Jan. 5, 1948, 0.6 Gm. (26 milliequivalents) sodium and 0.9 Gm. (26 milliequivalents) chloride daily.

partment with maintenance of a normal concentration of sodium in the serum. It is difficult to determine

11. Bollman, J. L., and Mann, F. C.: Nitrogenous Constituents of Blood Following Transplantation of Ureters into Different Levels of Intestine, Proc. Soc. Exper. Biol. & Med. 24: 923-924, 1927.

beyond what point in the absorption of sodium clinical edema may be expected. However, it is doubtful that one could expect the absorption of excessive amounts of chloride in the absence of clinical edema if it were all absorbed in combination with sodium. It is possible that urea in the secreted urine may, by bacterial action in the bowel, be broken down to ammonia, which could combine with chloride in the urine and be reabsorbed as ammonium chloride. Or it is possible that the chloride ion may be absorbed in combination with a radical with which we are totally unfamiliar. The exact mechanism by which chloride absorption takes place is not clear at the present time.

TABLE 7.—*Age of 141 Patients Who Have Undergone Bilateral Ureterosigmoidostomy at Mayo Clinic Since 1939 and on Whom Blood Electrolyte Patterns Have Been Examined*

Age	Patients	Percentage
0 to 10	6	4
10 to 20	6	3
20 to 30	4	3
30 to 40	6	4
40 to 50	27	19
50 to 60	63	45
60 to 70	31	22
Total	141	100

PRESENT STUDY

We have examined the blood electrolyte patterns of 141 patients who have undergone bilateral ureterosigmoidostomy at the Mayo Clinic since 1939. Only those cases have been included in which repeated values for blood urea, plasma chloride and carbon dioxide-combining power were available. Of this number 118 (84 per cent) were male and 23 (16 per cent) were female. The age distribution is shown in table 7. One hundred and twenty-one patients (86 per cent) were older than 40 years, with 63 (45 per cent) in the sixth decade. The oldest patient was 67 years of age and the youngest 16 months. Causative diagnoses are detailed in table 8, 116 (82 per cent) having had the operation for vesical carcinoma. In 16 cases (11 per cent) the operation was performed in two stages, one stage bilateral ureterosigmoidostomy having been performed in the remaining cases.

TABLE 8.—*Diagnoses* *

Diagnosis	Cases	Percentage
Vesical carcinoma	116	82.3
Interstitial cystitis	8	5.7
Exstrophy of bladder	12	8.5
Urethrovaginal fistula	2	1.4
Urinary incontinence	2	1.4
Traumatic rupture of urethra	1	0.7
Total	141	100

* The clinical material is the same as in table 7.

If 600 mg. per hundred cubic centimeters of plasma (103 milliequivalents per liter) is accepted as the normal value for chloride, then in our series 112 patients (79 per cent) have manifested some degree of hyperchloremia since their operations (table 9). In 14 (88 per cent) of 16 cases in which operation was performed in two stages, hyperchloremia developed after the second ureter was transplanted.

The interval between transplantation of the ureters and the development of elevated chloride values has varied from two days to nine years, but in the majority of cases (106; 75 per cent) hyperchloremia has developed within one year. If, as we have suggested previously, hyperchloremia develops as a result of resorption of chloride from the sigmoid and rectum, with increasing difficulty for the body in ridding itself of chloride, it seems likely that, in those cases in which hyperchloremia develops in the early postoperative days, it does so because of the quantity of chloride poured into the body in the form of isotonic sodium chloride solution. In those cases in which hyperchloremia develops late in the postoperative course it undoubtedly does so because of the amount of sodium chloride ingested in the normal daily diet (8 to 10 Gm.) or because of the patient's gradually increasing capacity to retain urine in the sigmoid and rectum for longer periods.

If 50 to 60 volumes per hundred cubic centimeters of plasma (23 to 27 milliequivalents of bicarbonate per liter) are considered to be normal values for the carbon dioxide-combining power of the plasma, then 113 (80 per cent) of our series of 141 patients have shown laboratory evidence of acidosis of some degree, as manifested by values for the plasma carbon dioxide-combining power of less than 50 volumes per hundred cubic centimeters (table 10). In 11 (69 per cent) of the 16 cases in which the operation was performed in two stages, acidosis developed after the second ureter was transplanted.

TABLE 9.—*Highest Values for Chloride in Plasma* *

Values			
Mg. per 100 Cc.	Milliequivalents per Liter	Cases	Percentage
600 or less	103 or less	29	21
600 to 625	103 to 107	34	24
625 to 650	107 to 111	34	24
650 to 675	111 to 115	23	16
675 to 700	115 to 120	12	9
700 or more	120 or more	9	6
Total		141	100

* Highest value for chloride in plasma was 705 mg. per hundred cubic centimeters (121 milliequivalents per liter); the clinical material is the same as in table 7.

As in the case of plasma chloride, evidence of acidosis developed at varying intervals after operation, from two days to nine years, but the majority of patients (109; 77 per cent) have shown evidence of acidosis, with or without symptoms, within one year.

CLINICAL PICTURE

In the past two years we have had the opportunity to study thoroughly 8 patients with severe hyperchloremic acidosis who previously had undergone bilateral ureterosigmoidostomy. In all cases the clinical picture was similar. The patient first noticed easy fatigability and weakness, soon followed by anorexia. This latter symptom progressed in all cases to revulsion to food and the development of nausea and vomiting. All patients complained of a persistent salty taste in their mouths, with increased thirst associated with ingestion of large volumes of water. Loss of weight (40 pounds [about 18 Kg.] in 1 case) was the rule, undoubtedly owing to inanition. One patient remarked on complete disappearance of his ability to

perspire, even during warm weather, and on decreased tolerance to cold. In all cases rectal urgency and diarrhea were present, with the passage of frequent, copious, watery stools.

MANAGEMENT

On the basis of observations in case 1 it was apparent that the disturbed electrolyte pattern could be immediately corrected by the simple device of eliminating urine as soon as it entered the rectum. However, the more practical solution to the problem appeared to us to be dietary in nature. Consequently, on July 29 we placed the patient on our routine low salt diet (0.5 Gm. of sodium) (table 11) with the addition of supplementary sodium bicarbonate in a dosage of 4 drachms (about 16 Gm.) daily to compensate for the deficiency of sodium in the diet. Six days after this program was instituted, Aug. 4, 1947, alkalosis was found to have developed owing to the excessive amount of sodium bicarbonate ingested (fig. 1). Within twenty-four hours after administration of sodium bicarbonate had been discontinued, the carbon dioxide-combining power had returned to normal levels (table 2).

As a result of this experience, the next few patients seen were instructed to follow the same dietary program in the electrolyte pattern by several days, the rise in the value for carbon dioxide-combining power to normal likewise preceding the decrease in plasma chloride values to normal by several days.

TABLE 10.—*Lowest Value for Bicarbonate in Plasma* *

Values			
Volume per 100 Cc.	mEq. HCO_3^- per Liter	Cases	Percentage
60 or more	27 or more	3	2
50 to 60	23 to 27	25	18
40 to 50	18 to 23	58	41
30 to 40	14 to 18	38	27
20 to 30	9 to 14	16	11
20 or less	9 or less	1	1
Total	.....	141	100

* Lowest value for bicarbonate ion in plasma was 13.6 volumes per hundred cubic centimeters (6.1 milliequivalents bicarbonate per liter). The clinical material is the same as in table 7.

gram but were given sodium bicarbonate in the dosage of 60 grains (4 Gm.) daily. This program has proved more satisfactory and has served to maintain blood electrolytes essentially within normal limits. However, in 2 patients who have returned for reexamination we have noticed a tendency to hypochloremia and hyponatremia (table 4). Consequently, we have in our later cases employed a more liberal diet containing 1.6 Gm. of sodium and 2.2 Gm. of chloride daily (table 12). One patient who remained on this program for five months has recently returned to the clinic with an entirely normal blood electrolyte pattern.

We have allowed our patients to use salt-free fluids freely. In addition, we have advised them not to hold urine in the rectum any longer than is necessary but to empty the rectum at every available opportunity.

RESULTS OF TREATMENT

All patients treated on this program have become symptom free within a period of one week, and biochemical evidence of hyperchloremia and acidosis has disappeared, with return of chloride and bicarbonate values to normal and in some instances with improvement in renal function. Correspondence with some patients and reexamination of others have indicated continuance of a state of essentially normal health. In all cases symptomatic improvement preceded improve-

SUMMARY AND COMMENT

Of 141 patients who have undergone bilateral ureterosigmoidostomy and in whom the electrolyte pattern has been studied, in 79 per cent hyperchloremia developed with levels for plasma chloride varying from 103 to 131 milliequivalents per liter, and in 80 per cent acidosis developed with bicarbonate levels in the plasma ranging between 6 and 23 milliequivalents per liter.

TABLE 11.—*Routine Low Salt (0.5 Gm. Sodium) Diet* *

Constituents	Amount
Protein	71 Gm.
Carbohydrate	201 Gm.
Fat	120 Gm.
Calories	2,300
Sodium	0.5 Gm.
Chlorine	0.8 Gm.
Calcium	0.9 Gm.
Iron	0.012 Gm.

* Diet is adequate in all vitamins according to recommended allowances of the National Research Council. Values are approximate.

There seems to be evidence that in this group of patients hyperchloremic acidosis occurs as a result of absorption of chloride across the rectal mucosa from urine stored in the rectum and sigmoid. The manner in which chloride is absorbed is not entirely clear. Some of it may be absorbed as sodium chloride, but it is probable that the greater part is absorbed in a manner which is, at the present time, unknown.

Hyperchloremic acidosis is accompanied with a rather characteristic syndrome: fatigability, weakness, anorexia, loss of weight, salty taste, nausea and vomiting, nitrogen retention, polydipsia and diarrhea (polyuria), which symptoms are promptly relieved by correction of the acidotic state. Control of hyperchloremic acidosis developing in patients after bilateral ureterosigmoidostomy, or prevention of the condition, may be had by careful attention to values for chloride and carbon dioxide-combining power and by the avoidance of the parenteral use of sodium chloride solution in the early postoperative period unless there is chemical evidence of a chloride deficit, and later by the use of a low chloride diet augmented by supplementary doses of sodium bicarbonate. If a commercial salt substitute is used, care should be taken that the product does not contain one or more "chloride" salts as ingredients. The patient must be instructed not

TABLE 12.—*Low Chloride Diet* *

Constituents	Amounts
Protein	75 Gm.
Carbohydrate	260 Gm.
Fat	110 Gm.
Calories	2,300
Sodium	1.6 Gm.
Chlorine	2.2 Gm.
Calcium	0.9 Gm.
Iron	0.013 Gm.

* Diet is adequate in all vitamins according to recommended allowances of the National Research Council. Values are approximate.

to hold urine in the rectum for a longer period than necessary.

The degree of salt restriction in the diet and the dosage of supplementary sodium bicarbonate cannot be standardized but must be regulated according to the electrolyte response in each patient. For this reason, it is of the utmost importance that chemical determination of the electrolytes in the patient's blood, particularly of chloride and bicarbonate, be made at periodic intervals.

It is apparent that such a derangement in the electrolyte pattern of the blood may significantly alter the entire electrolyte and water balance of the body. Many questions remain unanswered; many facets of the problem remain to be explored. In the recognition and study of this condition one canont avoid being impressed by the statement made by Darrow [12] that "disturbances in electrolyte metabolism may develop in man in almost any disease at any age" and that "the practical applications must vary considerably according to the disease and the reaction of the patient."

ABSTRACT OF DISCUSSION

ON PAPERS BY DRS. MCCREA; MUIRHEAD, VANATTA AND GROLLMAN, AND FERRIS AND ODEL

DR. HUGH J. JEWETT, Baltimore: As early as 1940 it seemed clear to associates and me that urea and probably other urinary constituents were reabsorbed from the bowel in certain cases after ureterosigmoidostomy. Several years later we observed that acidosis was even more conspicuous than azotemia and was readily controlled by sodium bicarbonate or citrate. Three theories were advanced to explain this acidosis. First, there might be a loss of sodium from the bowel; second, the kidneys might be sufficiently damaged from back pressure, with or without infection, to destroy the enzyme carbonic anhydrase and thus prevent the elimination from the body of hydrogen ion across the tubular epithelium, and third, acid radicals from the urine might be reabsorbed from the bowel and returned to the plasma. However, we were never able to find a convincing case to support the first theory and, with Drs. Ferris and Odel, believed that the damage sustained by most of these kidneys was too slight to explain the large defects in the electrolyte pattern of the blood. This led us to accept the validity of the reabsorption theory, but we did not recognize that chloride ion alone was responsible for the acidosis. Drs. Ferris and Odel have done a real service in clarifying this perplexing problem and outlining a rational method of management. The fact that the elevation of plasma chloride is usually out of proportion to that of urea in these cases is interesting. I should like to ask Dr. Odel whether he believes this results from the relatively large size of the urea molecule or from the splitting of urea into carbon dioxide and ammonia so that all of it is not available for reabsorption. The following case further emphasizes some of the salient points of Dr. Odel's paper. The patient was a woman with one kidney who had had a ureterointestinal anastomosis. After operation she had all the changes in the blood described by Dr. Odel. Even with alkalinization her carbon dioxide-combining power ranged from 14 to 21.6 milliequivalents and her chlorides from 109 to 120 milliequivalents, per liter. After nephrostomy the chloride level fell to 87 milliequivalents and the carbon dioxide-combining power rose to 28.4 milliequivalents, per liter. This strongly suggests that her previous hyperchloremia was caused by reabsorption from the bowel.

DR. VICTOR F. MARSHALL, New York: It seems reasonable to assume that a patient with decreased renal function will be less able to compensate for his rectal reabsorption, so that obstruction and infection are still among the major problems. The data necessary have been clearly indicated by the authors. One of the valuable points to be gained from this presentation is that certain patients can be tided over such episodes, including those during their early postoperative course. I would like to add one bit of substantiation to the idea of chloride absorption from the rectum. In more than one case it has been possible to reduce the serum chlorides from abnormally high levels to normal levels by continuous rectal drainage, without any lavage, drugs or change in diet. The description of the clinical syndrome by Drs. Ferris and Odel corresponds with our experience, but it should be added that in those in whom this complication develops after discharge from the hospital it usually does so gradually, while the early postoperative occurrence has usually been rather abrupt. Too many of these listless, tired patients have been labeled neurotic. I should like to ask Dr. McCrea what regimen he advises after nephrectomy, especially in regard to prophylactic measures for the remaining urinary tract—such as endocrine substances or vitamins. The paper of Dr. Muirhead and associates brings up several important points. Though papillary necrosis is usually bilateral, it is not invariably so. Since this is so, and since the mortality is high, even in the unilateral cases the possibility of nephrectomy should be considered. Admittedly, cases suitable for nephrectomy will not be common. Nephrectomy has been reported for apparently unilateral papillary necrosis, with excellent results, notably by Robbins, Mallory and Kinney. I was given the impression by the 3 cases reported here, reports in the literature and a limited personal experience that some primary disease antedates this necrosis in every case. In nondiabetic persons an obstruction is the rule, and, of course, obstruction and infection go hand in hand in urology. I should like to ask whether the condition has been found, even rarely, when a urinary obstruction or diabetes has been clearly absent.

DR. FRANKLIN FARMAN, Whittier, Calif.: Dr. Muirhead has detailed an interesting concept of a problem both clinically and experimentally. Few cases are recognized clinically, and most are recognized at autopsy. Many cases of unexplained urinary infection of the type of pyelonephritis with obstruction might be explained on this basis. Dr. Jewett has brought up the question whether infection precedes or follows the necrosis. Dr. Muirhead emphasizes that ischemia of the medulla plays an important part. Among the diseases in which altered renal blood flow producing ischemia may be a factor in the pathogenesis is papillary necrosis. In certain diseases there may be obstruction of the interlobular artery, due to spasm, circulating toxins, infectious material or thrombi, and a diversion of the blood stream into the medullary area. Christian has said that both papillary and cortical necrosis of the kidney are dependent on circulatory blockage somewhere along the line. Most cases of cortical necrosis have been recognized in pregnancy, whereas papillary necrosis usually has occurred in diabetic persons and in those having pyelonephrosis with obstruction.

DR. RUBIN FLOCKS, Iowa City: I want to congratulate Dr. Ferris and Dr. Odel on their work. Recently associates and I have experimented with more radical surgery of the pelvis. Frequently it has been necessary to transplant the right ureter into the cecum and the left ureter into the descending colon. The problem has arisen in 2 cases whether it would be safe to transplant the right ureter into the cecum, with the left kidney destroyed. In those 2 cases I was afraid, and we ended up with nephrostomy. I should like to ask Drs. Ferris and Odel whether they think the absorption from the colon is different higher up in the colon than it is down in the sigmoid and whether transplantation of the ureter of a single kidney to the cecum would be safe.

DR. LOWRAIN E. MCCREA, Philadelphia: With regard to the question of Dr. Marshall, I will admit, I have nothing to offer as a suggestion of doing anything to prevent the occurrence of leukoplakia. This is the first case of leukoplakia of the renal pelvis that I have seen. It will be very interesting to note the progress of this woman. At the present time she has shown a continuance of the infection with Escherichia coli, and she has just completed a course of aureomycin therapy. Intravenous pyelogram and subsequent cystoscopy reveal normal conditions except for a mild, congestive cystitis. But whether

12. Darrow, D. C.: Disturbances in Electrolyte Metabolism in Man and Their Management, Bull. New York Acad. Med. 24: 147-165 (March) 1948.

or not infection plays a role, or whether avitaminosis is the basis of such a condition, I am at a loss to say. In an attempt to review the literature as to the percentage of occurrence of leukoplakia of renal pelvis, progressing to the ultimate formation of squamous cell carcinoma, I was not able in any reference to find a definite percentage of all the pathologists, and all the records that I have been able to find state that it is a supposed precursor, without giving a percentage.

DR. E. E. MUIRHEAD, Dallas, Texas: The remarks of Dr. Jewett and the question posed by Dr. Marshall are related. The fact that papillary necrosis has occurred in the diabetic person, without evidence of obstruction, and the fact that obstruction is so frequently associated with infection in the pelvis and kidney have led to the idea that infection constitutes an integral feature of the pathogenesis of papillary necrosis. That is really why the observations in this study struck us as being peculiar, in that a very high percentage of instances of coagulation necrosis, at the border zone of the parenchyma and the pelvis were observed in the absence of evidence of inflammation in the parenchyma proper. Obviously, this is not the usual thinking in the pathogenesis of this lesion and requires further observation. There is one part of this study, not related to the pathogenesis of papillary necrosis, which we did not have an opportunity to mention in the regular discussion. In the study of ureteral ligation with contralateral nephrectomy, there are interesting aspects to the blood pressure of the animal. Usually the blood pressure tends to be elevated for a period of a few days, and then it drops down to the control level, where it remains until the animal succumbs. If the obstruction is unilateral, with a contralateral kidney still intact, the pressure is slightly elevated and then returns to and remains normal after the contralateral nephrectomy. If the obstruction is bilateral, the pressure reaches substantial levels and returns to the control level in somewhere around a week. The interesting point is that the recession of the pressure is not related to the subsequent deterioration of the animal; in other words, deterioration of the animal occurs later, after the recession of the pressure. This is in keeping with other observations, that, in certain circumstances, in which the renal tissue is still intact within the body and viable, renal insufficiency of the excretory type may develop without the development of sustained hypertension.

DR. H. M. ODELL, Rochester, Minn.: With regard to Dr. Jewett's question about the disproportion between the increase in urea and the tremendous increase in plasma chlorides in many of these patients, he has touched on a perplexing question that is still unanswered, the manner in which chloride is absorbed. The best way to answer that question probably is to assume that selective absorption exists in the rectum. It is known that some degree of selectivity must be present, for in these patients the plasma creatinine level invariably remained normal unless the patient had other evidence of renal insufficiency, in which case we could expect elevated values for plasma creatinine on the basis of renal parenchymal damage. It is entirely possible that urea may be split in the bowel into carbon dioxide and ammonia and not all be available for absorption. At present the manner in which chloride is absorbed, whether in combination with sodium as sodium chloride or in combination with some other cation, is unknown. If the former is true, we cannot account for the increase in the amount of sodium that would almost have to be present; if these patients became edematous and showed evidence of expansion of the extracellular compartment, we would be more willing to assume that an excess of sodium is present in the extracellular fluid spaces. In addition to the normal values for plasma creatinine found in the majority of these persons, there is another factor which points to essentially normal renal function in the presence of acidosis, and that is the frequency with which such patients exhibit a normal concentration of contrast medium in the kidneys at the time urography is done. I want to stress that, in addition to use of the low sodium diet and supplemental bicarbonate of soda, we have cautioned all our patients to empty the rectum at every available opportunity instead of attempting to exert as much control of the rectal sphincter as possible. In regard to the question about the difference in absorption of urea at different levels in the bowel, I have no specific information other than the observations of Bollman and Mann, who found differential absorption of urea in different segments of the colon and the small bowel, the general rule being that the higher the transplant was done, the greater the degree of urea absorption and azotemia.

SPLENIC PUNCTURE

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and
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Splenic puncture, unlike liver puncture, is a procedure that has not been accepted in clinical medicine in the United States. Except for isolated reports,[1] there is no discussion of this technic in the American medical literature, nor is it even mentioned in any of the better known American monographs or textbooks of hematology. Our knowledge concerning splenic puncture is based primarily on reports emanating from areas bordering the Mediterranean Sea. Although splenic puncture has been practiced since the nineteenth century by Widal,[2] the most comprehensive studies have been published comparatively recently by Moeschlin,[3] Émile-Weil,[2] Introzzi[4] and Pittaluga.[5] It is therefore the purpose of this paper to review the experience at this clinic, where splenic puncture has been practiced as an almost routine procedure in the study of splenomegalies, particularly on the hematology service, and to evaluate its usefulness in clinical medicine as well as to discuss its hazards and contraindications.

TECHNIC OF SPLENIC PUNCTURE

The method used in splenic puncture is essentially similar to that described by Moeschlin and Émile-Weil with the addition of several precautionary measures to decrease pain and the danger of hemorrhage.

The patient is given nothing by mouth for at least eight hours prior to puncture, which is done with the patient in bed to obviate the necessity of moving him after the biopsy. The patient in supine position is placed at the left of the bed, with body arched to widen the interspaces of the left thorax and, especially in obese persons, to make it easier to slide the needle between the ribs. The inspiratory and expiratory borders of pulmonary resonance are then percussed. A point is selected over an interspace approximately between the upper and lower borders of percussion and marked while the patient is in expiration, since the spleen is penetrated in this phase of respiration. However, some authors[6] recommend puncture during inspiration to avoid von Nagy's reflex, a sudden reflex descent of the diaphragm as the needle penetrates the peritoneal cavity. In patients with a large spleen a transabdominal approach may be utilized.

The skin is painted with an appropriate antiseptic and draped with a sterile eyecloth. A 1 or 2 per cent solution of procaine

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From the Department of Medicine, University of Chicago. Aided in part by a grant from Amcour and Company and in part by an Institutional Grant from the American Cancer Society.

1. Hess, J.: Splenic Puncture As a Diagnostic Procedure in Infancy and Childhood, Ann. Int. Med. 4:467-483, 1930.

2. Émile-Weil, P.; Isch-Wall, P., and Perlès, S.: La ponction de la rate: Procédé de diagnostique cytologique, Paris, Masson et Cie, 1936.

3. Moeschlin, S.: Die milzpunktion: Technik, diagnostische und haematologische Ergebnisse, Basel, Benno Schwabe & Company, 1947.

4. Introzzi, P.: La punctura della milza, in Ferrata, A.: Le emopatie, Milan, Societa Editrice Libraria, 1935, vol. 2, pt. 3.

5. Pittaluga, G.: La ponction de la rate comme moyen d'exploration au fins de diagnostic, Rev. méd. franç. 1:51-52, 1935.

6. (a) von Nagy, G.: Ueber die Technich der Milzpunktion im Säuglings und über ihren diagnostischen Wert, Klin. Wchnschr. 3:274-276, 1928. (b) Hess.[1] (c) Émile-Weil, Isch-Wall and Perlès.[2] Moeschlin.[3] Introzzi.[4] (d) Pittaluga.[5]

hydrochloride (novocaine hydrochloride®) and a 25 gage needle is used and the skin, subcutaneous tissue and muscle are infiltrated with sufficient procaine to give good anesthesia to as great a depth as the needle will reach while the patient is breathing restfully. An incision is made through the anesthetized tissue with an abscess blade to enable the biopsy needle to slide more easily through the skin and to prevent carrying skin into the pleural or peritoneal cavities.

The anesthesia is then continued with a 2 inch (5.08 cm.) 22 gage needle. Procaine hydrochloride solution is expressed continuously as the needle is slowly pushed through the tissues into the pleural cavity and then into the diaphragm. During this time the patient continues to breath slowly; he may experience some minor discomfort but no real pain as the pleural and peritoneal cavities are entered. When the needle enters the peritoneal cavity its point will then rub against the spleen, which is moving slowly up and down with the patient's diaphragmatic excursions. This almost invariably imparts a characteristic gritty, rubbing feeling. The patients experience no pain at this rubbing of the splenic capsule or penetration of the spleen itself. The patient is instructed to inspire deeply and then expire and hold his breath, after which the needle is pushed about 1 to 2 cm. into the spleen and then extracted, pressure being exerted continuously on the plunger of the syringe.

The Vim®-Silverman needle with hollow forked obturator but without solid stylet in the outer needle is used to obtain the biopsy specimen in a manner exactly similar to that when doing a liver puncture. The spleen is entered as described for the 22 gage anesthetizing needle, the tissue is obtained in expiration, and the needle and obturator are withdrawn. In the event that the patient breathes while the needle is in the spleen, the needle should be held lightly and allowed to move freely with the respiratory excursions of the spleen.[7] Great care must be taken in removing the pencil of tissue from the obturator, because any unnecessary handling will invariably cause extreme distortion and may ruin the specimen completely. The patient is then rolled onto a sandbag so that he rests for two hours on his left side with the biopsy site centered on the sandbag; thereafter, he remains at absolute bed rest until the next morning and is allowed nothing by mouth for at least five hours after the procedure has been completed. Moeschlin, Tempka [8] and Émile-Weil also caution against early ambulation.

HISTOLOGIC TECHNIC

After a small piece is removed for *abklatsch* preparations, according to Downey's technic,[9] the specimen is prepared by the Maximow technic; that is, fixed in formaldehyde solution-Zenker's solution (Helly's fluid) for six to eight hours, sectioned at 6 microns in nitrocellulose and stained by hematoxylin, eosin and azure II.[10] The pathologic observations will be reported in the future in connection with various clinical aspects of the cases.

Suffice it to say that sections are more informative than smears, since the architecture is preserved in sections and with the Maximow technic individual cells may be recognized as accurately as in smears. In the smears there is a great deal of contamination from peripheral blood which is not constant in amount. Usually cells from the red pulp sinuses are smeared out in greater number than from the red pulp cords or white pulp.[3] Occasionally the reverse is true, and a nodular mass of white pulp is smeared out [8]; this may lead to a mistaken diagnosis of lymphatic leukemia.[2] In smears there is less chance of obtaining granulomatous lesions, and if they are obtained, they are more difficult to recognize than in sections.[4] In Banti's disease and other fibrous splenomegalies it is often impossible to aspirate splenic tissue, and frequently peripheral blood is all that is obtained [11]; but with the Vim®-Silverman needle one obtains a pencil of tissue free from peripheral blood. Since far more tissue is obtained with the Vim®-Silverman needle, there is never any shortage of tissue for culture, as frequently happens when a needle and syringe is used according to the technic of Émile-Weil.

MATERIAL

Table 1 summarizes the clinical status of the 55 patients and ninety-two splenic punctures of this study. The patients varied in age from 6 months to 72 years. Patients with a wide variety of splenomegalies, except that due to idiopathic thrombopenic purpura, had biopsies.

Since hemorrhage is so important a complication, column 3 of table 1 lists the various abnormal observations which might predispose to hemorrhage. These are of two general types, defects in the hemostatic mechanism itself and nonspecific factors. Practically every patient had determinations of bleeding time, clotting time, clot retraction, thrombocyte count and prothrombin time; in addition heparin tolerances were determined in some patients.

It is apparent that numerous patients, particularly those with primary diseases of the hematopoietic tissues, had a significant bleeding tendency. For example, patient 5 had a bruising tendency, several of the patients with lymphatic leukemia had thrombopenia and patient 50 had a bleeding time of eleven minutes. Patient 35, who did not have laboratory data recorded, had received a triple dose of nitrogen mustard (methyl-bis-[2-chloroethyl]-amine hydrochloride) on each of two successive days. This dose had previously evoked a dangerous bleeding tendency in several other patients, and presumably this patient had prolonged bleeding and clotting times and increased heparin tolerance. Case 39 is of special interest in this regard, since this patient had a prolonged bleeding time, thrombopenia and occasional petechiae. Three hours after the biopsy specimen was obtained signs of intracranial hemorrhage developed; by the following day generalized bleeding had supervened, and he died thirty-six hours after the splenic puncture. At autopsy, in spite of generalized hemorrhages, there was no evidence of bleeding from the splenic puncture; in fact, the latter site could not be identified with certainty.

Some of the nonspecific factors predisposing toward hemorrhage in these patients were generalized senile arteriosclerosis (patient 6), congestive heart failure (patient 31) and obstruction of the inferior vena cava with a huge caput medusae and increased portal pressure (patient 32). This latter patient as well as patient 55 were so dyspneic that puncture had to be performed while they were in semi-Fowler's position. Besides these physical factors, patients 14 and 55 were deaf and unable to cooperate adequately, patient 19 had a depressive psychosis, and patients 30 (6 years of age with mental retardation) and 54 (6 months of age) were too young to cooperate intelligently.

Column 4 of table 1 summarizes the cases which were complicated by demonstrable hemorrhage. There were 4 instances in which there was evidence of bleeding intraperitoneally (patients 2, 17, 40 and 46). Patient 2

7. (a) Aravantinos, A.: Modification dans la technique de la ponction de la rate, Bull. Soc. path. exot. **9**:444-448, 1916. (b) Caronia: Diagnostic de la leishmaniose par la ponction de la rate et de la moelle comparé, ibid. **15**:722-729, 1922.

8. Tempka, T., and Kubarek, M.: Das normale und pathologische Splenogramm im Lichte eigener Untersuchungen, Folia. haemat. **60**:18-37, 1938.

9. Downey, H.: The Myeloblast, in Downey, H.: Handbook of Hematology, New York, Paul B. Hoeber, 1938, pp. 1963-2039.

10. Buchsbaum, R., and Losah, C.: Methods of Tissue Culture, in Vitro, in Outline of Histological Methods, Chicago, University of Chicago Press, 1936.

11. Émile-Weil, Isch-Wall and Perlès,[3] Moeschlin.[3]

did not complain but on questioning admitted that he had mild pain in the left lower abdominal quadrant for about three hours after the splenic puncture. He had not remained in bed afterward but had deliberately disobeyed orders and become ambulant within two hours after the biopsy specimen was taken. Patient 17 received multiple transfusions and had hemorrhage severe enough to cause oliguria for eighteen hours. Because of an error in nursing orders, she was ordered out of bed and made to walk across the hospital twice within three hours after the splenic puncture. Patient 40 with Banti's disease was one in whom splenic puncture was performed without incident but in whom the bleeding time was elevated. About one and one-half hours after the puncture he had left-sided pain and signs and symptoms of shock. He responded to bed rest, but about four hours later, after he was allowed to take liquids by mouth, shock again developed, which necessitated multiple transfusions. In retrospect, this patient should have had more stringent management as soon as he had noted pain; especially he should have had immediate transfusions, fluids by the parenteral route and nothing by mouth, as did patient 46 in similar circumstances and with much quicker recovery.

TABLE 1.—*Clinical Status of 55 Patients Undergoing Ninety-Two Splenic Punctures*

Patient	No. of Splenic Punctures	Bleeding Tendencies	Complications
		Myelogenous Leukemia	
1 P. O.	2		
2 W. M.	5	Abnormal heparin tolerance test, got out of bed one hour after splenic puncture; terminal condition at last biopsy	Moderate pain in left lower abdominal quadrant
3 J. B.	4	Hemorrhage after dental extractions; clotting time 44 min.	
4 G. M.	5	Hemorrhage after dental extractions	
5 G. V.	4	Petechia and ecchymoses	
6 T. T.	1	Clotting time 43 min.; senile arteriosclerosis; abnormal heparin tolerance	
7 L. R.	4	Clotting time 37 min., 80,000 thrombocytes at last puncture	
8 F. G.	1	Abnormal heparin tolerance	
9 D. H.	1		
Total	27		1
		Lymphosarcoma	
10 J. S.	1	85,000 thrombocytes	
11 J. S.*	1		
Total	2		0
		Giant Follicular Lymphoma	
12 E. L.	1	Auricular fibrillation and congestive heart failure; arteriosclerosis	
Total	1		0
		Lymphatic Leukemia	
13 T. B.	2		
14 D. T.	1	Deaf and dumb; 150,000 thrombocytes; clotting time 29 min.	
15 A. B.	2	85,000 thrombocytes, little clot retraction at 24 hr.	
16 H. S.	6	Arteriosclerosis; congestive heart disease; severe anemia; 60,000 thrombocytes	
17 J. B.	1	Arteriosclerosis; cerebral hemorrhage; congestive heart failure; 60,000 thrombocytes	Intra-abdominal hemorrhage, oliguria
18 W. B.	2	Arteriosclerosis; cerebral hemorrhage; congestive heart failure; 60,000 thrombocytes	
19 N. F.	2	Uremia; 55,000 thrombocytes; bleeding time 11 min.; depressive psychosis	
20 J. G.	2	Pericardial effusion; congestive heart failure; purpura and ecchymoses	
21 B. K.	1	Unable to understand English and could not cooperate well	
Total	19		1
		Infectious Mononucleosis	
22 M. S.	1		
Total	1		0
		Hypersplenism	
23 L. P.	1		
24 D. G.	1		
25 R. T.	1		
26 S. B.	1		
27 G. C.	1	Spleen acutely distended with blood	
28 E. W.	1	30,000 thrombocytes; bleeding time 11 min.	
Total	6		0
		Fat Storage Disease	
29 H. T.	1	138,000 thrombocytes; petechia	
30 D. P.	1	Aged 6 yrs.; mental retardation; refused to cooperate	
Total	2		0
		Polycythemia Rubra Vera	
31 M. G.	1	Arteriosclerosis; congestive heart failure; walked home 3 hr. after splenic puncture	Died after hemorrhage into abdominal wall musculature
Total	1		1
		Hodgkin's Disease	
32 J. L.	4	Orthopneic and dyspneic; congestive heart failure; portal hypertension with caput medusae; splenic puncture done with patient in Fowler's position	
33 E. L.	1	Homologous serum jaundice	
34 R. S.	2		
35 J. H.	3		
36 V. F.	3	Triple dose of nitrogen mustard	
37 R. S.	1		
38 J. W.	1		
Total	15		0
		Acute Leukemia	
39 V. B.	1	Bleeding time 11 min.; 18,000 thrombocytes; petechia and generalized bleeding	
Total	1		0
		Hepatosplenomegaly (Banti's Syndrome)	
40 R. T.	1	Bleeding time 6 min. 45 sec.; aortic regurgitation; history of tarry stools	Intra-abdominal bleeding; 6 transfusions
41 F. P.	1	Aortic regurgitation; prothrombin 75%	
42 F. L.	1		
43 M. W.	1		
44 D. P.	1		
45 M. W.	1		
46 J. G.	1		Intra-abdominal bleeding; 1 transfusion
Total	7		1
		Myeloid Metaplasia	
47 F. V.	2	Acute splenomegaly; clotting time 34 min.	Died of rupture of splenic pedicle
48 G. C.	1	Severe anemia; 800,000 red blood cells; arteriosclerotic	
49 R. S.	1		
50 H. M.	1	No clot retraction for 15 hr., bleeding time 11 min.	
51 C. B.	1	Purpura; 82,000 thrombocytes, died from gastrointestinal hemorrhage one week after splenic puncture	
52 F. Y.	1		
53 N. N.	1		
Total	8		1
		Gargoylism	
54 G. Y.	1	Aged 6 mo.	No specimen obtained
Total	1		1
		Amyloid Disease	
55 S. S.	1	Prothrombin 70%; deaf and dumb; dyspneic and unable to hold breath; splenic puncture done with patient in semi-Fowler's position	
Total	1		0

There were 2 deaths following splenic biopsy. Patient 31, an elderly woman with senile arteriosclerosis, congestive heart disease and myeloid metaplasia with myelosclerosis following polycythemia vera had what seemed to be an uneventful transabdominal splenic puncture performed. Hourly examination during the four hours she remained in bed failed to reveal anything unusual. Then, against orders, she left the hospital and walked home, a distance of 1 mile (1.6 kilometers). Six hours after the splenic puncture, examination revealed a painful egg-sized mass over the biopsy site. The mass was freely movable and clearly not attached to the spleen, which was not tender. By thirteen hours after the puncture this mass measured about 30 by 12 cm.; it increased rapidly in size until the patient died of anuria forty-eight hours after the biopsy specimen was taken. At autopsy a huge dissecting hematoma was found, originating in the left rectus abdominis muscle. The site of the splenic puncture could not be identified with certainty, nor was there any evidence of intraperitoneal hemorrhage. It is possible that hemorrhage would not have developed if the patient had remained in bed, and it is almost certain that she would have not died if the bleeding vessel in the abdominal wall had been ligated when she returned to the clinic six hours after the puncture.

TABLE 2.—*Summary of Data on Splenic Punctures*

A. Number of punctures		
Myelogenous leukemia	27	
Lymphosarcoma	2	
Giant follicular lymphoma	1	
Lymphatic leukemia	19	
Infectious mononucleosis	1	
Hypersplenism	6	
Fat storage diseases	2	
Polycythemia rubra vera	1	
Hodgkin's disease	15	
Acute leukemia	1	
Banti's syndrome	7	
Myeloid metaplasia	8	
Gargoylism	1	
Amyloid disease	1	
Total	92	
B. No specimen obtained	1	
C. Complications		
Fatalities due to hemorrhage from spleen	0	
Hemorrhage from spleen	4	(oliguria in 1)
Fatalities	2	(torsion of splenic pedicle, intramuscular hemorrhage)

Patient 47 was asymptomatic until four hours after the biopsy specimen was obtained. At that time, while eating lunch and reaching across the abdomen with her left hand, she experieinced sudden agonizing abdominal pain and went into shock. At operation one and one-half hours later her spleen was found to have torn completely free from the splenic pedicle, which was filmy and delicate in structure in spite of the huge size of the spleen. There was no evidence of any hemorrhage from the biopsy site. In the opinion of surgeon and pathologist laceration of the pedicle was not related to splenic biopsy.

In summary (table 2) it would appear that there were no deaths as a result of hemorrhage from the spleen. There were 4 patients who had evidence of intra-abdominal bleeding, 3 of whom needed transfusions and in 1 of whom oliguria developed. Of the 3 instances of significant intra-abdominal bleeding, only 2 occurred in a patient in whom the splenic puncture was managed correctly. In only 1 instance, a baby aged 6 months (patient 54), was insufficient splenic tissue obtained.

By far the greater percentage of patients failed to experience any pain at all, and many did not even know that the splenic puncture had been completed. Occasional patients had a mild aching over the biopsy site or in the left lower abdominal quadrant or referred to the left shoulder. The 2 patients with pronounced intra-abdominal hemorrhage had severe pain. In general, most patients agreed that it was a less uncomfortable procedure than sternal marrow aspiration. Those who also were subjected to liver biopsy believed that the two procedures were similar as far as discomfort was concerned.

Through the courtesy of Dr. Dwight Clark of the Department of Surgery, the spleen of patient 27, who had congenital hemolytic anemia, was biopsied at splenectomy with the area under direct visualization. Microscopic examination revealed a spleen with red pulp sinuses tremendously distended by erythrocytes. After removal of the needle a thin trickle of blood about 2 mm. in diameter was seen to flow so slowly from the biopsy site that the motion of the blood could hardly be detected. After four minutes there was no evidence of cessation of bleeding, and the blood loss was estimated at 3 to 5 cc. The gloved finger of the surgeon was then placed over the biopsy site without slowing the flow of blood. A piece of omental fat was dropped on the bleeding point without application of pressure, and in two minutes bleeding ceased. At examination of the spleen two days [3] and three days [12] after puncture it is impossible to find the location of the puncture in the spleen.

DIAGNOSTIC VALUE OF SPLENIC PUNCTURE

Splenic puncture is of importance because of the valuable clinical information obtained and as an investigative tool. At present microscopic examination is more informative than any other method available in the study of splenomegalies of obscure origin. Consequently, splenic puncture in the absence of any contraindications has been recommended as a routine diagnostic procedure in the study of these conditions.[13]

Microscopic examination of splenic tissue is one of the most successful means of differentiating between atypical leukemia or cryptic types of leukemia and the various types of hypersplenism, especially splenic neutropenia [4] and the fat storage diseases.[14] Similarly, a decision concerning the indications and contraindications for splenectomy, which is usually a difficult problem, may be reached more accurately in cases involving splenomegaly.[15] This is especially true in Banti's disease and thrombosis of the splenic vein when the procedure is combined with liver biopsy. Patients who are likely to be benefited by splenectomy have little if any extramedullary hematopoiesis, whereas patients with other types of splenomegaly, particularly those due to leukemia and myeloid metaplasia, not only are poor surgical risks but may do worse after splenectomy. The major exception to this rule is the combination of leukemia and secondary hemolytic anemia, in which splenectomy may be the only method of combating the anemia.

In patients with aleukemic blood and in whom aspiration of marrow has failed to yield a diagnostic smear,

12. Émile-Weil, Isch-Wall and Perlès.[3] Introzzi.[4]

13. (a) Morrison, M.; Samwick, A., and Landsberg, E.: Sickle Cell Anemia in the White Race: Report of Two Cases with Diagnosis by Splenic Puncture, Am. J. Dis. Child. 64: 821-837, 1942. (b) Nassau, E.: Beitrag zur diagnostische Bedeutung des Milzpunktion im Säuglingsalter, Arch. f. Kinderh. 78: 203-206, 1926. (c) Pick, L., cited by Nassau.[13b] Hess.[1] Émile-Weil, Isch-Wall and Perlès.[3] Introzzi.[4] Pittaluga.[5] von Nagy.[6]

14. Löwinger, S.: Die Bedeutung der Knochenmark- und Milzpunktion für die Diagnose des Morbus Gaucher, Folia haemat. 53: 126-134, 1935.

15. Forconi, A.: Pour confirmer l'importance des ponctions de la rate, Sang. 13: 380-392, 1939.

splenic puncture will frequently, in our experience as well as that of Émile-Weil,[2] Forconi [15] and Moeschlin,[3] reveal a lymphoma or leukemia. However, Arneth [16] expressed his belief that all such problems may be resolved without splenic puncture, and Benhamou [17] stated that splenic puncture should be reserved at least until all other diagnostic methods have failed. According to Émile-Weil, an acute exacerbation of a chronic leukemia is preceded by changes in the spleen, therefore he advises examination of splenic tissue as an aid in treatment and prognosis.

Splenic puncture is of little use in the diagnosis of Hodgkin's disease, because too frequently diagnostic areas are missed and in the absence of any histologic structure, as in the smear technic, one must rely on the demonstration of typical Sternberg-Reed cells.[18] Moeschlin stated his belief that the diagnostic value of splenic puncture is restricted to patients with abdominal Hodkgin's disease. However, it may be possible to determine by biopsy whether an enlarged spleen will respond to roentgen or nitrogen mustard therapy, since the spleen poor in lymphocytes and with excessive fibrosis responds poorly.

Examination of splenic tissue has been most useful in this institution and in the experience of Forconi and Émile-Weil in the recognition of leukemoid reactions and pseudoleukemias. In the past eighteen months 8 cases of myeloid metaplasia have been discovered in a group of patients referred with the diagnosis of leukemia. Puncture in these cases yielded diagnostic information, and in none would the disease have been diagnosed correctly without splenic biopsy, in agreement with the experience of Jackson, Parker and Lemon [19] and Émile-Weil.[2] Irradiation of the spleen was avoided in these cases and a better prognosis offered the patient.

Splenic biopsy may be a useful tool in the diagnosis of infectious granulomas accompanied with splenomegaly. Unfortunately, these lesions are isolated and discrete and may be missed entirely, especially on smears of splenic tissue.[6c] If they are included in the biopsy specimen, they may not be found except by serially sectioning the whole specimen. There is usually nothing specific in the splenic cell structure in these cases if the granuloma is not smeared on the slide.[6c] Many caseating and noncaseating granulomas are nonspecific in nature,[20] and unless a specific etiologic agent is demonstrable one may not be able to differentiate the types of granuloma even when examining sections instead of smears. However, culture or animal inoculation of otherwise negative splenic tissue may reveal an etiologic agent.[6a] Furthermore, the demonstration of a granuloma does not exclude the presence of a coincidental hemolytic anemia, nor does it exclude the probability that the patient will be benefited by splenectomy.[21]

According to investigators who have performed this procedure on patients with tropical diseases, examination of splenic tissue is the most fruitful method known in the diagnosis of leishmaniasis, Chagas' disease and malaria; frequently it is the only means of making a definite diagnosis in patients in whom examination of the peripheral blood, bone marrow, lymph nodes and even liver has failed to reveal any etiologic organism.[22] In patients who reside in an area in which more than one parasite is endemic, proof of the simultaneous occurrence of more than one disease may be made only by splenic puncture.[23] It is so useful a technic that Pittaluga and Introzzi recommend it as a routine procedure in examination of children for leishmaniasis, although according to Introzzi a splenic biopsy revealing normal cytology does not positively exclude a diagnosis of kala-azar.

In the great percentage of cases sternal marrow aspiration will demonstrate the presence of fat storage cells in the primary lipoidoses such as Gaucher's disease, Niemann-Pick disease and the various types of essential cholesterol storage diseases. Yet a review of the literature on the technics available for the diagnosis of these diseases in general and Gaucher's disease in particular has revealed that there are cases in which a positive microscopic diagnosis may be made by splenic biopsy when all other means have failed.[24]

Culture of splenic tissue may be used to demonstrate organisms when other means have failed.[25] As early as 1905 Hayashahiva [26] performed splenic puncture on 109 patients with typhoid in whom culture of splenic tissue revealed bacilli in 94 per cent of the cases, whereas the organisms were demonstrable in only 58 per cent of the roseolas and 18 per cent of the stools cultured. Introzzi found the organisms in splenic aspirates in typhoid when all other methods of investigation were negative, and he recommended splenic cultures in any suspected infection with negative blood culture. However, Ciaravino and Sofia [27] had no success in an attempt to culture Brucella organisms from the spleen in 10 cases of brucellosis.

EVALUATION OF THERAPY

Medical literature abounds in speculation on the effects of therapy on the cells of the hematopoietic tissues in general and the spleen in particular. Unfortunately, except for rare exceptions, these speculations are based on counts of the peripheral blood or on isolated biopsies or postmortem examination of splenic tissue without any adequate pretreatment control or follow-up biopsies. The deficiencies of this already too extensive literature have been reviewed by Lubarsch and Wätjen,[28] Prym,[29] Block and others.[30] It should

16. Arneth, J.: Ueber den qualitativen Blutbefund bei der chronischen aleukämischen leukämisch-lymphatischen Reaktion (Leukämie) ohne Organvergrösserungen, Rontgenwerkung, "Kryptoleukämie" und Milzpunktion, Folia haemat. **6**: 97-118, 1940.

17. Benhamou, E.: Exploration functionnelle de la rate, Paris, Masson et Cie, 1933.

18. Battistoni, L., and Perazzini, F.: La diagnosi citologica del granuloma maligno per puntura middollare, splenica e ghiandolare, Haematologica **30**: 89-112, 1941. Introzzi, P.: La punctura della milza nel granuloma maligno, ibid. **13**: 571-586, 1932. Storti, E.: Importanza diagnostica della punctura di milza per alcune varietà di linfogranuloma maligno, Riforma med. **53**: 779-783, 1935.

19. Jackson, H.; Parker, F., and Lemon, H.: Agnogenic Myeloid Metaplasia of the Spleen: A Syndrome Simulating Other More Definite Hematologic Disorders, New England J. Med. **223**: 985-994, 1940.

20. Forbus, W.: A Clinico-Pathologic Consideration of Granulomatous Inflammation, Chicago M. Soc. Bull. **50**: 307-315, 1947.

21. Jacobson, L., and Block, M.: Unpublished data. Moeschlin.[3]

22. Ciaravino, E., and Sofia, F.: La splenogramma nella malaria, Boll. Soc. ital di med. e ig. trop. **1**: 301-314, 1946. Manson-Bahr, P.: Technique of Splenic Culture in Diagnosis of Kala Azar, Lancet **2**: 70-71, 1925. Prado-Vargas, G., and Mazpule, M.: Importancia de la puncion de los organos hematopoyeticos en il diagnostico del paludismo cronica, Informm. med. **7**: 82-84, 1943. Hess.[1] Introzzi.[4] Pittaluga.[5] von Nagy.[6a]

23. Dao, L. L.: La puncion esplenica como medio de diagnostico en un caso de enfermedad de Chagas, Bol. hosp. Caracas **42**: 10-17, 1944.

24. Block, M., and Jacobson, L.: The Histogenesis and Diagnosis of the Osseous Type of Gaucher's Disease, Acta Haemat. **1**: 165-177, 1948. Pittaluga.[5]

25. Widal, cited by Introzzi.[4]

26. Hayashahiva, cited by Nagy.[6a]

27. Ciaravino, E., and Sofia, F.: La splenogramma nella febre melitense, Boll. Soc. ital. di med. e ig. trop. **1**: 315-322, 1946.

28. Lubarsch, O., and Wätjen, J.: Allegemeine und spezielle pathologische Histologie der Strahlenwerkung, in Lazarus, P.: Handbuch der gesamten Strahlenheilkunde; Die physikalischen, chemischen und pathologischen Grundlagen der gesamten Strahlenbiologie und Therapie, vol. 1, Munich, F. J. Bergmann, 1928.

29. Pryms, P.: Die Therapeutischen Röntgenbestrahlungen vom pathologisch-anatomischen Standpunkte, in Krause, F.: Handbuch der Röntgentherapie, Leipzig, Werner Klinkhardt, 1927.

30. Block, M.; Spurr, C.; Jacobson, L., and Smith, T.: Histopathologic Effects of Nitrogen Mustard Therapy upon Normal and Neoplastic Hematopoietic Tissues, Am. J. Clin. Path. **18**: 671-689, 1948.

be obvious that the only logical method to study the effect of various chemotherapeutic agents on splenic histology is by examination of splenic tissues with sufficient frequency to insure adequate control and follow-up specimens. No amount of peripheral blood counts or isolated observations at autopsy will ever suffice in this regard.

CONTRAINDICATIONS

It is extremely difficult to evaluate contraindications to splenic puncture, since these vary from complete rejection of the technic by most members of the medical profession in any and all circumstances to the attitude of Émile-Weil and Pittaluga that tissue from every enlarged spleen should be biopsied except in the presence of a clear-cut hemorrhagic tendency. Pittaluga asserted that a dogmatic rejection of splenic puncture comes from two sources, those who have had no personal experience and base their objections on theoretic considerations and those who have had a complication following a limited experience with the procedure.[31] In contrast, investigators with extensive experience with the technic seldom encounter complications.[2]

Since hemorrhage is alleged to be so frequent and dangerous a complication it is pertinent to examine its frequency following splenic puncture. The largest series has been reported by Pittaluga and his colleagues, embracing twenty years of experience and including 2,000 cases of kala-azar alone with a mortality of 0.3 per cent. Most of these fatalities occurred in infants near death with kala-azar. Muir,[32] according to Introzzi, performed a thousand splenic punctures without incident, and the latter has used this measure without incident for many years. Moeschlin's monograph is based on one hundred and eighty successful splenic punctures, although he is much more conservative than the others as far as contraindications are concerned. According to the many years of experience of Émile-Weil, complications are exceedingly rare and are all due to poor technic. In the present series, although many patients who would be considered poor risks underwent splenic puncture, there was no fatality due to hemorrhage from the spleen and there were only 2 cases in which significant bleeding from the spleen occurred although the patient and operator had followed all necessary precautions. Hayashahiva used splenic puncture in 109 cases of acute typhoid and Ciaravino in 23 cases of malaria and 10 of brucellosis without incident. It would appear that splenic puncture is at least as safe a procedure as liver puncture, which today is gaining increasing acceptance. No less an authority than Manson-Bahr stated that it is a safe procedure when done correctly. Introzzi's opinion that although an experienced physician may perform splenic puncture for years without incident one cannot exclude the possibility of splenic rupture and death is well taken. Whether the hole made by the needle is insufficient to cause serious hemorrhage or whether a laceration must be made [4] seems of little importance compared to the facts that splenic puncture, similar to hepatic puncture, is potentially dangerous and that in any large series some mortality may be expected. A hemorrhage may occur in a patient whose puncture has been without incident and who does not have any bleeding tendency, while numerous patients who are poorer risks will be punctured without any trouble.

It is universally agreed that no patient with a clear-cut defect in hemostasis should be subjected to splenic puncture, and Caronia expressed the belief that a hemorrhagic tendency is the only contraindication. Many physicians experienced in the technic consider that any demonstrable defect in hemostasis or any clinical manifestation of a hemorrhagic tendency should be a contraindication.[33] However, in my experience and that of Émile-Weil's, patients with even a fairly pronounced hemorrhagic tendency may undergo splenic puncture without any complications. Both Moeschlin and Émile-Weil advised caution in patients with polycythemia vera. It should be noted that one of the fatalities in this series (patient 31) was an elderly woman with polycythemia vera, although there was no evidence of bleeding from the spleen itself.

Cooperation of the patient is a fairly important consideration. Consequently, Moeschlin advocates avoidance of puncture of lethargic or poorly responsive persons. However, particularly in Mediterranean areas, children, who are usually not cooperative, are subjected to splenic puncture in a routine manner.[34] In a completely refractory or a psychotic person the procedure is certainly an added risk and more to be feared than in a child or a deaf patient.

An acutely enlarged spleen is frequently considered a contraindication to puncture [35] because it is usually soft and may not have adequate fibrous support, increasing the tendency to rupture. Nevertheless, Hayashahiva in typhoid and Émile-Weil in typhoid and subacute bacterial endocarditis performed numerous splenic punctures without incident. In this regard Introzzi advised against puncturing a spleen that contracts after the injection of epinephrine. Similarly, painful spleens ought not to be subjected to splenic puncture, if this point of view is taken, because pain is frequently due to a sudden increase in size or to an infarct.

A septic splenomegaly has often been considered a contraindication because of the danger of disseminating infection, yet the experience of Hayashahiva would appear to attach little importance to the danger of such a possibility. Introzzi and Émile-Weil performed punctures in this circumstance, stating that this objection is more theoretic than actual, since the needle hole is too small to serve as an avenue of dissemination. In fact, some authorities emphasize that success in isolating a causative organism may depend on availability of splenic tissue juice for culture or animal inoculation.

The failure to demonstrate a spleen sufficiently large to be palpable is accepted as sufficient reason for rejection of the technic except by Introzzi and Caronia. Unless the spleen is at least twice normal size, a point at which it will usually be palpable, it is small enough to be missed entirely or to be transfixed with a needle.

SUMMARY

1. The technic of splenic puncture is described.

2. Proper technic of the physician in the performance of splenic puncture and absolute bed rest for the patient following it are indispensable in the avoidance of hemorrhage.

31. (a) von Staubenranch: Zur Frage der Milzpunktion, Beitr. z. klin Chir. **80**:712-713, 1913, 1914. (b) Wohlgemuth, K.: Verblutungstod nach Milzpunktion, Zentralbl. f. Chir. **48**:653-656, 1921.
32. Muir, cited by Introzzi.[2]
33. Hess,[1] Caronia.[2b]
34. Caronia,[2b] Nassau.[35b]
35. Moeschlin,[3] Introzzi,[4] von Nagy,[5] Aravantinos,[7a] von Staubenranch.[31a]

3. In spite of adequate technic and proper selection of patients in any large series, the complication of intra-abdominal hemorrhage may arise.

4. Splenic puncture has a definite place in the differential diagnosis of splenomegalies and may be the only method of making a definite diagnosis and avoiding splenectomy in patients in whom it is contraindicated.

5. It is absolutely irreplaceable in studies attempting to evaluate the effect of various forms of treatment on the cellular constituents of the spleen.

6. A decided hemorrhagic tendency and a non-palpable spleen are absolute contraindications to splenic puncture.

7. Future studies will be needed to determine whether a mild hemorrhagic tendency, a sudden increase in the size of the spleen, a painful spleen and a septic splenomegaly are absolute or relative contraindications to splenic puncture.

8. Splenic puncture, like liver puncture, may be considered to be a calculated risk in which, over a number of years, benefit to a series of patients will outweigh the risk of serious hemorrhage in an occasional patient.

Clinical Notes, Suggestions and New Instruments

TREATMENT OF ACNE PITS BY ABRASION WITH SANDPAPER

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Acne is an extremely prevalent skin disease. It afflicts all nationalities and all classes of society. In North America it seems to be equally common in all climates. As a result, the sequela of acne, the scarred and pitted face, is seen in every community. The victims are literally and figuratively marked persons, and their suffering is great. It is bad enough for men, but for women it is tragic.

Almost without exception these persons can be helped to some degree by mechanical abrasion. This method is not widely known. It is my experience that few members of the medical profession are even aware of its existence.

Now, as in the past, the active disease is treated by dermatologists. This is as it should be. It is the residual scar which is of interest to the surgeon.

The acne pustule often destroys the full thickness of the skin. Healing is by second intention, and, on contraction, the scar pulls below the surface of the neighboring skin, forming a pit. The same succession occurs in smallpox and chickenpox, except that, since these are acute diseases, a much shorter time is required. The pit is not the only mark. In some instances, an inflammatory wall about a focus thickens over a period of months and years, forming a nodule. After the infection is extinguished, this nodule remains as solid mass of fibrous tissue or as a mass of cheeselike material encysted in a fibrous envelope. Finally, there is the sinus or tunnel, which results when two or more pustules coalesce with a bridge of uninvolved epidermis between. The morphologic types of acne scars are, therefore, pits, mounds and tunnels, of which the most common is the pit.

Since roentgen therapy is of great value in the treatment of acne, a high percentage of the patients who consult the surgeon have been exposed to this agent. Despite all precautions, it is evident from the appearance of the face that many persons have been treated beyond their tolerance. The effects of excessive irradiation of skin are well known. Endarteritis and consequent diminished blood supply are followed by fibrosis and, in many cases, by ulceration of the skin. This extreme condition is rarely seen when the therapy has been applied by experienced persons. However, a moderate amount of fibrosis is common. This manifests itself in a slightly shrunken appearance of the face and a telltale drawing and grooving of the nasolabial folds. It is important to note this condition, because such persons tolerate less abrasion than average. In such cases, it is often wise to be satisfied with the result of a single thorough sanding, as further abrasion may result in the appearance of keloid.

The earliest concept of the pitted face was that of an uneven surface that had to be made smooth. This concept still applies, since it is not the color or texture of the pit that attracts attention but the lights and shadows playing on an uneven surface. For a generation various destructive agents, such as acids, have been used in an attempt to produce a smooth skin. These are of value, though they have sometimes fallen into disrepute from having been used by charlatans. Solid carbon dioxide operates in a similar manner. The difficulty with such agents is that of control. A light application produces little visible result, whereas a heavy application may, by penetrating too deeply, destroy the skin and produce generalized scarring.

The principle behind the use of such caustics is dekeratinization. With the thinning of the normal skin in the area, the sharp distinctions of the pits are obliterated and a much smoother effect is produced. The same result can be obtained with mechanical abrasion. For the past decade surgeons interested in cosmetic improvements have experimented with various abrasives. The skin has been scraped with scalpel blades, razor blades, needles grouped like a curry comb, rough stones, disks, brushes and no doubt other agents which have not come to my attention.

Sandpaper, which in my hands has been the most satisfactory abrasive, was suggested by Dr. Preston Iverson of Philadelphia. More recently, various motor-driven tools, carrying an assortment of disks, have been used. To date, I have not found these tools as satisfactory as sandpaper for large, flat surfaces, though they are excellent for attacking small, inaccessible corners.

The presence of active acne pustules is a contraindication to abrasion. If these pustules are present, the patient should be referred to a qualified dermatologist, and surgical abrasion should be deferred until the activity is controlled. Once the skin is quiescent, abrasion may be performed at any time. Formerly I used local anesthesia for this operation. This was abandoned because the discomfort to the patient was great, and most subjects could tolerate abrasion of only part of the face at any one time. Furthermore, with repeated procedures, the patients faced each succeeding sanding with increasing dread. It is now my custom to hospitalize the patient and abrade the entire face at one time, with intratracheal anesthesia. Thus, operative discomfort is eliminated, and, in addition, the number of necessary procedures is enormously reduced.

Abrasion is carried to the point of profuse capillary bleeding. It is my experience that at the first operation the most vigorous sanding is safe. Theoretically, it is possible to go too deep, producing the equivalent of a third degree burn, with resultant scar and keloid. This becomes a serious consideration with persons who have undergone previous abrasion but is not a matter of concern at the first operation. Hemorrhage is controlled by pressure, after which petrolatum gauze, followed by a pressure dressing, is applied to the skin. Dressings are removed in ten days, at which time the abraded area is healed and dry in most cases. In a minority of patients who require an unusually deep abrasion or who have extremely reactive skin, the skin may not be healed. In a few cases a beefy, weeping surface may be present, even after ten days. After washing the face with soap and water, I apply a light dressing of penicillin ointment in these cases, and healing

From the Straith Clinic for Plastic Surgery.

Because of lack of space, this article has been abbreviated in THE JOURNAL by the omission of the illustrations. The complete article will appear in the reprints, a copy of which will be sent by the author on request.

ensues rapidly in a few days. The patient is then permitted to wash the face with soap and water and to apply cold cream and a light dusting of powder.

After a rest period of three to six months, the patient is reexamined, and further abrasion is done as indicated. This cycle is repeated until maximum improvement has been achieved. The question of when to stop can, in the last analysis, be answered only by the judgment of the surgeon, based on experience. One must not permit the enthusiasm of the patient to exert undue influence. In general, any patient can tolerate one deep sanding with safety. After three sandings, the surgeon should proceed with caution with any patient. Persons who have had much roentgen therapy will tolerate less, and often one thorough sanding is the limit for them. A point to be watched is the appearance of a small keloidal spot or streak on the skin. These areas appear where abrasion has removed all the skin at a given point, allowing granulations to form. Such keloids are small and can be removed by excision, but they serve as a warning that the skin is now extremely thin and that further abrasion is contraindicated.

Patients who, in addition to the usual diffuse pitting, present some unusually large and deep pits, together with mounds and tunnels, require special handling. These lesions must be excised, and I prefer to do this before the skin is sanded. Mounds and tunnels are subjected to elliptic excision and closure with subcuticular nylon suture. I have found it unwise to bury suture material in these cases, as reaction and extrusion of the suture is common. The sequel to this is a new scar, which must be excised.

I first attempted to thin the mounds to the level of the surrounding skin. This was not satisfactory, and I now excise them. Occasionally one sees a group of mounds, which gives the skin a nodular surface. There is so little skin between the nodules that the area must be excised as a unit. These excisions are done with local anesthesia. When all craters, tunnels and mounds have been eliminated, a rest period of three to six months is allowed, after which sanding is done.

To date the results obtained with these methods have been gratifying. No case has come to my attention in which some degree of improvement has not been achieved, and, in most instances, the improvement has been considerable. It is to be hoped that the use of these methods will become more widespread for the benefit of afflicted persons.

PROLONGED SURVIVAL FOLLOWING STREPTOMYCIN THERAPY OF TUBERCULOUS MENINGITIS

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Since the initial report of treatment of tuberculous meningitis with streptomycin by Cooke, Dunphy and Blake,[1] the efficacy of this therapy has been confirmed by numerous authors, particularly Hinshaw, Feldman and Pfuetze[2] and Bunn.[3] However, it appears that the longer such patients are followed, the less impressive are the results. Probably the ultimate survival rate following streptomycin therapy is 5 to 10 per cent, and many of these patients have incapacitating neurologic residua.[4]

We have had the opportunity of following a patient with tuberculous meningitis treated with streptomycin over a twenty-seven month period. He ultimately died of complications and reactivation of his infection. The case is of interest in that this patient was among the first to receive streptomycin therapy for tuberculous meningitis. Furthermore, the patient's prolonged survival and temporary clinical recovery illustrate the fallacy of attributing cures of this condition to streptomycin therapy when follow-up is not protracted.

REPORT OF A CASE

R. M., a 13 year old white boy, was first admitted to the John Gaston Hospital on Jan. 3, 1947 because of headache and drowsiness. Illness began with one watery stool eleven days prior to admission. There were no other complaints until eight days before admission, when continuous frontal headache developed, associated with anorexia and temperature of 100 F. Severity of the headache progressively increased. Three days before admission, the patient's temperature rose to 102 F. and he began to complain of double vision. Past history indicated that the patient had always been a sickly child but that no serious illnesses had been experienced. A roentgenogram of the chest, which had been taken April 28, 1942, was interpreted as showing healed primary tuberculosis. No other member of the family was ill, and no exposure to tuberculosis was known.

Physical examination revealed a temperature of 100 F. The patient was somewhat irrational, thin, pale and apparently rather ill. Mild nuchal rigidity was present. The margins of the optic disks were obliterated, and slight engorgement of the fundal veins was noted. The gait was staggering. Sensory examination showed normal conditions. Tendon reflexes were hypoactive but equal. The red blood cell count was 5,240,000 per cubic millimeter; hemoglobin was 13 Gm., and the white blood cell count was 16,850, with 72 per cent neutrophilic segmented cells, 1 per cent basophils, 1 per cent monocytes and 26 per cent lymphocytes. The urine was normal. The spinal fluid contained 495 cells per cubic millimeter, of which 99 per cent were lymphocytes. A pellicle formed, which contained no tubercle bacilli on Ziehl-Neelsen stain. Culture of the spinal fluid for pyogenic cells was sterile. Tests of the spinal fluid showed 165 mg. protein per hundred cubic centimeters, 36 mg. sugar and 640 mg. chlorides. Many additional lumbar punctures were done, with spinal fluid changes similar to those on admission. Cultures of the spinal fluid for acid-fast bacilli on two occasions were sterile. A roentgenogram of the chest showed normal conditions.

Administration of streptomycin, 1,600,000 units intramuscularly every day, was started on Jan. 6, 1947 and continued until February 21.[5] In addition, 100,000 units of streptomycin were given intrathecally every day during this period. During the ensuing three months, the patient continued to have fever and displayed varying degrees of drowsiness, irrationality and confusion. Transient dilatation of the right pupil was observed. Occasional diplopia occurred. Facial weakness on the right side and positive Brudzinski's and Kernig's signs were temporarily present. Abdominal reflexes remained intact, but deep tendon reflexes disappeared. Tinnitus developed after streptomycin had been given for a month.

When the patient was discharged, March 10, spinal fluid pressure was 370 mm. of water, and the fluid contained 115 lymphocytes per cubic millimeter. Two subsequent admissions occurred during the ensuing month for observation and repeated lumbar punctures. The temperature was normal, and weight gain occurred. Although the patient complained of generalized weakness, no abnormal conditions were found on examination. The spinal fluid, however, continued to show 70 to 100 lymphocytes per cubic millimeter, an elevated level of protein and a reduced amount of sugar.

The patient was next admitted on September 4, because of right supraorbital headache and low grade fever of a week's duration. He had vomited twice, and his vision had become hazy. Since his previous admission, the patient had been able to attend school, play baseball and carry on the normal activities of a boy his age.

Physical examination revealed one diopter of papilledema. Tendon reflexes were absent. The spinal fluid contained 253

From the Departments of Medicine and Pediatrics, University of Tennessee College of Medicine and the John Gaston Hospital.

1. Cook, R. K.; Dunphy, D. L., and Blake, F. G.: Streptomycin in Tuberculous Meningitis, Yale J. Biol. & Med. 18:221 (Jan.) 1946.

2. Hinshaw, H. C.; Feldman, W. H., and Pfuetze, K. N.: Treatment of Tuberculosis with Streptomycin, J. A. M. A. 132:778 (Nov. 30) 1946.

3. Bunn, P. A.: One Hundred Cases of Miliary and Meningeal Tuberculosis Treated with Streptomycin, Am. J. M. Sc. 216:286 (Sept.) 1948.

4. Dowling, H. F.; Sweet, L.; Hirsh, H. L., and Lepper, M. H.: Specific Therapy of Bacterial Infections of Central Nervous System, J. A. M. A. 139:755 (March 19) 1949.

5. Streptomycin was obtained through the efforts of Mr. L. W. Dean, superintendent, and Miss Roberta Carder, director of the Social Service Department, John Gaston Hospital.

cells per cubic millimeter, of which 98 per cent were lymphocytes. Spinal fluid protein was 194 mg. per hundred cubic centimeters; sugar, 43 mg., and chlorides, 700 mg. The white blood cell count was 11,550 per cubic millimeter; the red blood cell count was 5,790,000, and hemoglobin was 13 Gm. The differential white cell count was within normal limits. Urinalysis again showed normal conditions. Numerous smears of spinal fluid showed no acid-fast bacilli, and three cultures for acid-fast bacilli were sterile. However, a culture of the ventricular fluid showed tubercle bacilli.

Roentgen examination of the chest again showed normal conditions. Ventriculograms revealed moderately severe symmetric dilatation of the lateral and third ventricles, with no evidence of a filling defect. The fourth ventricle was not visualized.

Streptomycin therapy was again started on September 6, with daily doses of 0.8 Gm. given intramuscularly, and was continued until November 1. The daily dose was then raised to 1.2 Gm. intramuscularly. This therapy was continued until Jan. 1, 1948.

Bronchoscopic examination showed no abnormalities. On Sept. 30, 1947 suboccipital exploration and decompression were done by Dr. C. D. Hawkes. Adhesive arachnoiditis involving the cisterna cerebellomedullaris, the lateral pontine cisterns and the aqueductus cerebri was found. Microscopic examination of arachnoid tissue removed at operation showed lymphocytes and macrophages throughout; this was interpreted as evidence of chronic inflammation. After operation the eyegrounds became normal; the patient remained afebrile and was discharged November 3.

The patient was last admitted on Feb. 24, 1949 because of dizziness, mild headache and malaise of three weeks' duration. Since the previous admission the patient had improved and had been able to return to school, where he made superior marks. He had taken an active interest in sports and social activities, had been elected president of his class and had been considered by his family to have completely recovered from his illness.

Physical examination showed blood pressure of 130 systolic and 72 diastolic. Moderately firm bulging of soft tissue through the occipital cranial defect was noted. Severe choking of the optic disks was found on ophthalmoscopic examination. Laboratory studies revealed a normal red cell count and hemoglobin content. The white cell count was 16,300, with 5 per cent neutrophilic nonfilamented leukocytes, 63 per cent neutrophilic filamented leukocytes, 2 per cent basophils, 24 per cent lymphocytes and 6 per cent mononuclear cells. The urine was normal. The erythrocyte sedimentation rate was 18 mm. in 60 minutes (Wintrobe). Roentgen examination of the chest again showed the heart to be normal in size and contour and the lung fields to be clear. Roentgen study of the skull disclosed numerous circular areas of decreased density, representing erosion of the inner table of the cranial vault.

During the ensuing three weeks, progressive increase in tension of the decompression was noted. The voice became brassy in quality. Stupor became deeper, and inability to swallow necessitated feedings through a nasal tube. Slight dilatation of the right pupil appeared, and tendon reflexes were consistently absent. Gag reflex was diminished. Urinary retention developed. Ten days after admission a ventricular catheter was inserted. Ventricular fluid was grossly pink tinged and contained 4,970 red cells and 30 white cells per cubic millimeter. Ventricular fluid protein was 41.5 mg. per hundred cubic centimeters; sugar, 84 mg., and chlorides, 680 mg. Unremittent fever (103 to 104 F.) was resistant to antibiotic and sulfonamide therapy. Convulsions occurred frequently, and establishment of an airway was necessary. The patient died March 22, 1949, with evidence of bilateral pneumonia.

At autopsy, wide dilatation of the entire cerebral ventricular system was found. There were extensive plastic exudate and arachnoidal adhesions over the surface of the cerebral hemispheres and involving the cerebellopontine angles. At the root of the posterior ventricular horn on the left was a brownish, poorly circumscribed nodule about 0.3 cm. in diameter, consistent with a partially necrotic granuloma, in direct continuity with the ventricular lumen. Microscopically, multiple areas of caseous necrosis surrounded by epithelioid, Langhan's and round cells were seen in the chorioid, ependyma and meninges. Acid-fast organisms morphologically resembling tubercle bacilli were identified in smears from the surface of the brain. The lungs showed bronchopneumonia.

COMMENT

Although approximately 60 cases of spontaneous recovery from tuberculous meningitis without specific therapy have been reported, many are of doubtful authenticity.[6] In Bunn's series of 43 patients with tuberculous meningitis treated with streptomycin, 16 were still alive at the time of his report, four to fourteen months after the onset of their illness. A number of other reports of survival up to one year are in the literature.[7] Bauer and Sauer [8] have recently described a patient with proved tuberculous meningitis and pulmonary tuberculosis who was well, except for neurologic residua, twenty-two months after the incipiency of the meningitis. Vassilevich [9] reported survival of a patient for fifteen months.

We have been unable to find reports of other cases in which patients have survived as long as ours, although the unreported occurrence of such cases is known. Mitchell and Etteldorf [10] treated a patient who, after exposure to his tuberculous grandmother, acquired tuberculous pneumonia. While this patient was receiving streptomycin, tuberculous meningitis, proved by culture of tubercle bacilli from the spinal fluid, developed. After streptomycin therapy for eight months, there was complete remission of symptoms and signs, healing of the pulmonary lesion demonstrable by roentgenogram and disappearance of pleocytosis in the spinal fluid. The patient had remained asymptomatic twenty-four months after the onset of his illness.

That streptomycin frequently prolongs the life of patients with tuberculous meningitis is indubitable. Experience such as we have had in the case here reported, however, emphasizes again that streptomycin therapy for tuberculous meningitis is far from satisfactory, since, even though the immediate results are promising, patients may succumb later to complications of the original infection. Obviously, complete evaluation of the efficacy of streptomycin therapy in tuberculous meningitis must include the frequency of late complications, such as occurred in this case.

SUMMARY

A case of tuberculous meningitis treated with streptomycin, in which there was restoration of ability for normal activity, is reported. Complicating adhesive arachnoiditis was relieved by surgical intervention on one occasion with good results. However, the patient died twenty-seven months after the original attack of meningitis from reformation of arachnoidal adhesions, internal hydrocephalus and reactivation of meningeal tuberculosis.

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10. Mitchell, F. T., and Etteldorf, J. N.: Personal communication to the authors.

Disability Compensation Rolls.—Three out of every four of the 2,333,000 veterans on Veterans Administration disability compensation and pension rolls on Nov. 1, 1949, served in World War II. Nearly 1,000,000 dependents of deceased veterans were on Veterans Administration compensation and pension rolls on Nov. 1, 1949. Included were 393,000 widows and 287,000 children.—Veterans Administration, Information Service, Dec. 15, 1949.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

The Council has authorized publication of the following report.

R. T. Stormont, *Secretary.*

CURRENT STATUS OF THE CHEMOTHERAPY OF TUBERCULOSIS IN MAN

A Summary Report

This report is the third in a series [1] which have been made to the Council, at approximately twelve month intervals, of the cooperative study which has been conducted by the Veterans Administration, Army and Navy since the spring of 1946. The second report (written in July 1948, after the Fifth Streptomycin Conference) attempted to summarize the current status of streptomycin therapy in all types of pulmonary and extrapulmonary tuberculosis. The present report is less ambitious in scope. It concerns itself primarily with the changes in thought and practice which have occurred since publication of its predecessor. During this interval there has been little change in the understanding of the effectiveness and limitations of streptomycin per se; there has been considerable change in the concept of how it is best employed. There was rather general agreement on these matters at the Eighth Streptomycin Conference of investigators and consultants in November 1949. It is not the province of their study to make recommendations to the medical profession; certainly that is not the intention of this article, which is merely a recital of the experience of one group of investigators.

Since conclusions are only as valid as the data on which they are based, some account of the data is in order. They were presented to the conference by 42 hospitals [2] and describe the results obtained in treatment of approximately 7,000 patients with all types of tuberculosis by 22 different regimens. By early 1947, the fundamental fact that streptomycin does produce a tuberculostatic effect in clinical tuberculosis was regarded as having been demonstrated; since then, the study has resolved itself into one of comparative regimens in order to find those with a maximum of therapeutic efficacy and a minimum of undesirable side effects. It was therefore of first importance that the case material studied under the several regimens be as closely comparable as possible. This was attempted by a system of "randomization" (chance alternation) in the cooperating hospitals and appears to have been successful in great part. All patients were chosen and treated according to protocols which prescribed criteria for the selection of cases and set forth the regimens and laboratory procedures which were to be followed; all patients were observed for a sufficient period of time prior to treatment, to determine the course of their disease. On these accounts, and because a large number of cases were studied, it appears that certain valid conclusions can be drawn from the study.

STATUS OF STREPTOMYCIN

The first matter which bears reemphasis is that, in itself, streptomycin can never (or hardly ever) be counted on to cure tuberculosis. Even in those types of disease (e. g., tuberculosis of the alimentary tract and of draining cutaneous sinuses) in which the drug is particularly successful, relapse rates are about 5 and 10 per cent,[3] and in pulmonary disease they are about 35 per cent within twelve months after the completion of treatment.[4] There has been a mortality rate of 21 per cent in the 416 cases of pulmonary tuberculosis which have been observed for 2.5 years.[4] Of 66 patients with tuberculous meningitis, 67 per cent have died [4]; the figure would be higher than this if miliary disease were present as well.

This, of course, is looking on the dark side of the picture, but it is well to do so. The moral, it seems to the investigators, is that chemotherapy should be combined with other forms of therapy. They view with alarm the tendency to treat patients with streptomycin on an ambulatory basis: A patient sufficiently ill to receive streptomycin is sufficiently ill to be hospitalized. They view with despondency the common disposition to try a six or twelve week course of streptomycin therapy "to see what it will do." The investigators are generally agreed that, in pulmonary disease, the plan for treatment should be carefully worked out before streptomycin therapy is started, the surgical staff should be consulted in this planning and, because of the appearance of streptomycin-resistant tubercle bacilli, collapse or excisional surgery should be employed early in the course of streptomycin when it is indicated, rather than postponed because of roentgenologic improvement which may well prove to be transitory. In the early stages of the study, the necessity for detection of roentgenographic effects which could be assigned solely to chemotherapy made it impossible to permit concomitant surgery or collapse therapy; it is now being used in over one-half the cases. Because of the fundamental difference between the types of cases which do or do not receive collapse therapy, an improvement in results cannot be statistically demonstrated. No one entertains any doubt that it occurred.

EMERGENCE OF BACTERIAL RESISTANCE

Although it is admitted that by itself streptomycin cures tuberculosis in few cases, it still remains the most potent chemotherapeutic weapon presently available, and the question of how it should best be used—the optimum dosage and duration of treatment—is highly germane. It is with this aspect of chemotherapy that the study has chiefly concerned itself. With streptomycin, as with all drugs, therapeutic efficacy and toxicity are the determining factors, and neither can be considered without the other. In the case of streptomycin, a third factor has obtruded itself: The infecting bacteria develop a resistance to the drug which can be demonstrated in vitro. Occurring in vivo, this resistance renders further treatment with the drug ineffective and makes the patient a source for the spread of a tuberculosis which, although no more serious of itself, has the disadvantage of being unresponsive to therapy with streptomycin. It is the existence of this triad which has made it necessary to make so many changes in ideas concerning dosage and duration of treatment. For example, the first regimen which was studied, 2.0 Gm. daily for 120 days, produced therapeutic results equal or superior to those of any of its successors: Some degree of roentgenographic improvement (which was marked or moderate in 66 per cent) occurred in 83 per cent of 375 pulmonary cases,[1b] and sputum conversion occurred in 32 per cent. But 80 per cent of the patients thus treated showed some vestibular damage, as evidenced by vertigo, and approximately three fourths of those continuing to display positive sputum cultures (or one half of the whole group) had tubercle bacilli which were resistant to more than 10 micrograms of streptomycin per cubic centimeter. This was rather a high price to pay.

In an attempt to avoid this payment, the investigators explored two obvious expedients: (*a*) decreasing the duration of treatment to 60 days, while maintaining the daily dosage, and (*b*) decreasing the daily dosage to 1.0 and 0.5 Gm., while maintaining the duration. The results, already reported,[1b] were as might have been anticipated: The latter expedient had a good effect on toxicity; the incidence of vertigo, for example, decreased from 80 to less than 30 per cent with a dosage of 1.0 Gm. and to less than 10 per cent with a dosage of 0.5 Gm. Furthermore, this was accomplished, in the case of the 1.0 Gm. dose, with so little evidence of a concomitant reduction in

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Prepared by the Streptomycin Committee of the Veterans Administration, Washington, D. C., at the direction of the 42 Veterans Administration, Army and Navy hospitals which participated in the Eighth Streptomycin Conference, Atlanta, Ga., Nov. 10-13, 1949.

1. (*a*) The Effects of Streptomycin on Tuberculosis in Man, Report to the Council on Pharmacy and Chemistry, J. A. M. A. **135**:634 (Nov. 8) 1947. (*b*) Streptomycin in the Treatment of Tuberculosis, Report to the Council on Pharmacy and Chemistry, ibid. **138**:584 (Oct. 23) 1948.

2. Fitzsimons General Hospital (USA), Denver; Corona Naval Hospital (USN), Corona, Calif.; Veterans Administration Hospitals at Albuquerque, N. Mex.; Brecksville, Ohio; Bronx, N. Y.; Butler, Pa.; Castle Point, N. Y.; Chamblee, Ga.; Columbia, S. C.; Coral Gables, Fla.; Dayton, Ohio; Downey, Ill.; Excelsior Springs, Mo.; Fort Benjamin Harrison, Ind.; Framingham, Mass.; Hines, Ill.; Kerrville (Legion), Texas; Livermore, Calif.; Louisville, Ky.; Martinsburg, W. Va.; McKinney, Texas; Memphis (Kennedy), Tenn.; Memphis (Lamar Avenue), Tenn.; Minneapolis; New Orleans; Oakland, Calif.; Oteen, N. C.; Outwood, Ky.; Richmond, Va.; Rutland Heights, Mass.; San Fernando, Calif.; Springfield, Mo.; Staten Island, N. Y.; Sunmount, N. Y.; Temple, Texas; Vancouver, Wash.; Van Nuys, Calif.; Walla Walla, Wash.; Waukesha, Wis., and Wood Wis., and by Nopeming Sanatorium, Nopeming, Minn., and Glen Lake Sanatorium, Oak Terrace, Minn.

3. Minutes of the Seventh Veterans Administration-Army-Navy Streptomycin Conference, Denver, April 21-24, 1949.

4. Tables of Eighth Veterans Administration-Army-Navy Streptomycin Conference, Atlanta, Ga., Nov. 10-13, 1949, to be published.

therapeutic efficacy as to make it manifestly the regimen of choice. The position of the 0.5 Gm. dose was more equivocal; the series was relatively small (121 cases of pulmonary tuberculosis), but the proportion of patients who showed considerable roentgenologic improvement was definitely less (56 per cent as compared to 66), the incidence of relapses was greater and it was not clear that this reduction in dosage was justified by the further decrease in toxic manifestations. Subsequent experience with a daily dose of 0.2 Gm. (in the treatment of draining cutaneous sinuses) has shown it to be manifestly inferior to larger amounts in these circumstances.[3] The initial practice of injecting the daily dose in five or six divided portions was abandoned in favor of two daily injections, after this procedure was shown to be equally effective and somewhat less toxic [1b]; a further reduction to a single daily injection has since been adopted without any obvious loss of effectiveness.

But to return to the bête noire, resistance. Useful as the reduction of dosage had proved to be in diminishing toxic manifestations, it had been without effect on the development of resistance. The curves of incidence, for 2.0, 1.0 and 0.5 Gm. doses, given daily for 120 days, were practically identical. The development of resistance appeared to depend on the duration of treatment. On that account, while other matters were being explored in pilot studies, most of the investigators embarked, in April 1948, on an exploration of two new regimens in which 0.5 and 1.0 Gm. were given daily for 42 days to alternate patients with pulmonary tuberculosis. One year later the results in more than 1,300 cases were available for analysis.[5] There had been a decrease in the incidence of resistant bacilli in patients continuing to show positive cultures (from 80 to between 30 and 50 per cent),[5] which was a gain. But so far as results were judged by roentgenographic improvement and relapses (the incidence of sputum conversion is incompetent evidence because of the greatly increased use of collapse therapy in this group), the shorter regimens were definitely inferior to those lasting 120 days, which, of course, was a loss. Again 0.5 Gm. produced results slightly but uniformly inferior to those from 1.0 Gm.

One could summarize the present status of streptomycin therapy, given in daily injections and without other chemotherapy, in a single sentence: The incidence of toxic manifestations can be significantly diminished by reduction of dosage, but the development of resistance can be only partially avoided by decreased duration of treatment (to 42 days) and then only with a definite loss of therapeutic efficacy. The experience of two years, 1947 to 1949, had won only a partial victory. Fortunately, during these two years several promising avenues of approach had opened. Before the progress which has been made along these lines is described, a cursory account of the situation in extrapulmonary tuberculosis will be given.

EFFICACY IN EXTRAPULMONARY TUBERCULOSIS

Although the number of cases in which the results of treatment are now available is, of course, much larger than it was at the time of the previous report,[1b] there is little reason to change the opinions as to therapeutic efficacy which were expressed at that time. Lesions of the mucous membranes of the respiratory and alimentary tracts, draining cutaneous sinuses (with concomitant surgical treatment) and peritonitis continue to respond most promptly and uniformly to streptomycin therapy, with healing or considerable (more than "slight") improvement in 80 to 90 per cent of the cases.[5] There is no indication that the reduction in daily dosage (to 1.0 or even 0.5 Gm.) or in duration of treatment (to 42 days) affected these results adversely. A second roentgenologic review of tuberculosis of the bone and joint was conducted by a "jury" of orthopedic surgeons during the summer of 1949. Roentgenograms from 196 patients whose treatment with streptomycin had been completed six to twenty-four months previously were submitted by 31 hospitals for this review. It was the judgment of the jury that improvement occurred more rapidly and to a somewhat greater extent in patients who received streptomycin than in those who had no chemotherapy and that surgical procedures were made possible which would have been impossible without it.[6]

Similarly, the status of genitourinary tuberculosis is little changed. Cystoscopic and symptomatic improvement continues to be observed in approximately 80 per cent of the cases, genital lesions are not usually improved unless chemotherapy is accompanied with surgical treatment and, as would be anticipated, renal destruction demonstrated by pyelograms is infrequently benefited (20 per cent).[5] The conversion of urine cultures from positive to negative appears to be less common in patients receiving smaller daily dosages and briefer courses of treatment. The initial conversion rate (85 per cent) in the patients treated with 2.0 Gm. daily for 120 days has dropped to 59 per cent in those observed during a follow-up of one to two years and to 57 per cent in those observed for more than two years.[5] The clinical records of all cases of tuberculosis of the eye, ear, pericardium and skin were sent to designated specialists so that an unbiased and informed opinion might become available to the conference. The number of cases of cutaneous tuberculosis was inadequate to warrant comment, but in the other instances streptomycin was judged to have produced improvement in 50 to 85 per cent of the cases.[6]

MILIARY AND MENINGEAL TUBERCULOSIS

Miliary and meningeal tuberculosis deserve more detailed attention, not so much because any change has occurred in the picture in the past year as because of the interest which naturally attaches to them—after all, the effectiveness of streptomycin was first incontrovertibly demonstrated here. The first 100 cases which were treated in this study [1b] have now been followed for an additional year, between two and three years after the initiation of treatment.[5] During this period 3 additional patients died; there are now 21 survivors. All 100 patients were treated with streptomycin by both the intramuscular and the intrathecal route for a minimum of 120 days. The survival rate was relatively good (about 50 per cent) in miliary tuberculosis, unless this was accompanied or followed by meningitis (in which event it became zero) and was relatively poor (about 15 per cent) in "pure" meningitis. A total of 263 cases was reported to the Eighth Streptomycin Conference.[4] Because the earlier evidence was not regarded as an adequate basis for the recommendation of any single regimen, this larger group of patients had been treated with a variety of drugs (streptomycin, dihydrostreptomycin, promin[9] [sodium p,p'-diaminodiphenylsulfone-N,N'didextrose sulfonate], promizole[9] [4,2'-diamino-diphenyl-5'-thiazolesulfone] and para-aminosalicylic acid [PAS]), either alone or in combination and with varying dosages. This variation in treatment resulted in groups too small to sustain statistical analysis, but (the brief post-treatment observation should be borne in mind) there was nothing to suggest that the survival rate was improved over that of the first series of 100 cases. This experience, particularly in the case of meningitis, is less encouraging than experiences of other investigators. It is believed that the higher survival rate which they observed is due not to more promptness in the initiation of treatment but rather to the brevity of the follow-up in some instances and to the fact that they were usually dealing with children rather than adults. We anticipate little improvement from further juggling of regimens with the drugs presently available, but support of this opinion must come from groups with a larger series of cases or more ingenious ideas than ours. A few supplementary observations of interest were made on these patients: 15 per cent of 55 surviving patients with meningitis had residual central nervous system stigmas [4]; pathologic studies of the brains of patients who died with tuberculous meningitis disclosed destruction of basal ganglions in 23 per cent, healing by fibrosis in 45 per cent and some degree of hydrocephalus in 75 per cent.[8] It was also learned, by painful experience, that single intrathecal injections of streptomycin should not exceed 50 mg. and may, perhaps, be altogether omitted because of the increased permeability of the cerebrospinal fluid—blood barrier which accompanies infection.[5]

STREPTOMYCIN IN THORACIC SURGERY

One of the interesting aspects of this study concerns the use of streptomycin as a prophylactic in the course of thoracic surgical treatment to prevent "spread" of infection and other complications incident to the operative procedures. For this purpose, the drug has been administered for seven days before and for fourteen days following operation. In thoracoplasty, where alternate patients were treated, a statistically satisfactory

5. Footnotes 3 and 4.
6. Minutes of the Eighth Veterans Administration-Army-Navy Streptomycin Conference, Atlanta Ga., Nov. 10-13, 1949, to be published.

reduction in the incidence of spreads (from 5.6 to 2.0 per cent) was demonstrated in the 258 patients receiving streptomycin.[1b] In both treated and untreated groups, however, the incidence was so low that the routine use of prophylactic chemotherapy was considered inadvisable, particularly in view of the hazard of the development of resistant micro-organisms in multiple stage operations; the practice was therefore stopped in April 1948. In pulmonary excisions, prophylactic chemotherapy had been employed in all patients and the incidence of spreads was so low in comparison with prestreptomycin experience (2.2 per cent in 87 lobectomies and 3.8 per cent in 54 pneumonectomies [1b]) that it was decided to continue this practice. The results which were presented to the Streptomycin Conference of November 1949 appear in table 1.[6] They are distinctly less satisfactory than were those of the earlier series of streptomycin-treated patients, complications occurring three or four times more frequently. This might be regarded as a consequence of the larger number of patients who had received one or more courses of streptomycin therapy prior to operation. It certainly appears that, except in patients undergoing decortication, the incidence of complications was greater in those who had been thus treated. Data which would permit one to attribute this increased incidence to the development of resistant micro-organisms are not available, and it must be admitted that the mere fact that these patients had received streptomycin indicates a difference in the nature of their disease. Even in the group receiving streptomycin for the first time, however, the incidence of complications is higher than was the case in the original series. This difference can scarcely be attributed to deficiencies in surgical technic, for the hospitals and the surgeons participating in the study were for the most part the same as those concerned with the original series. If one were forced to interpret these results, one could say only that (*a*) operation is now being performed on patients in whom greater risks are involved and (*b*) a previous course of streptomycin therapy, whether because of the development of resistant micro-organisms or because of the different type of disease which its administration implies, is accompanied with an increasing number of postoperative complications. The surgeons concerned continue to believe in the routine use of streptomycin as a prophylactic in excisional surgical treatment.

DIHYDROSTREPTOMYCIN

Potentially, the most important thing which has happened in the chemotherapy of tuberculosis since our previous report [1b] is the introduction of additional bacteriostatic drugs. The first of these to be tried in the study was dihydrostreptomycin (DHSM), on which clinical work was started during the summer of 1948 and reports submitted to the Sixth Streptomycin Conference the following October.[7] The principal argument advanced in favor of this reduction product of streptomycin was the decreased toxicity which it was supposed to possess. There was little evidence available at that time concerning its relative therapeutic efficacy, and it was recognized (a recognition since confirmed) that it has no effect on tubercle bacilli which are resistant to the parent drug. Nor is its freedom from toxicity more than relative; it was admitted that, in sufficiently large doses, dihydrostreptomycin could produce all the toxic manifestations of streptomycin and the most that was hoped was that a daily dose of, for example, 2.0 Gm., could be given with relative impunity. This thought had less appeal because it had been adequately demonstrated [1b] that no definite advantage adhered to the routine use of this higher dose. However, the usefulness of dihydrostreptomycin was compared with that of streptomycin on alternate cases; this comparison is being continued, with each drug being given concomitantly with para-

TABLE 1.—*Incidence of Complications and Deaths Following Pulmonary Resections Performed with Prophylactic Streptomycin*

	Operations No.	Complications: Spread No.	Complications: Spread Percentage	Complications: Fistula No.	Complications: Fistula Percentage	Patients with Complications* No.	Patients with Complications* Percentage	Deaths: Operative No.	Deaths: Operative Percentage	Deaths: Nonoperative No.	Deaths: Nonoperative Percentage
Lobectomy											
Without previous course of streptomycin	178	17	9.6	6	3.4	25	14.2	7	4.0	2	1.1
With previous course of streptomycin	133	21	15.9	17	12.9	33	25.0	3	2.3	4	3.0
Pneumonectomy											
Without previous course of streptomycin	95	10	10.5	8	8.4	21	22.1	7	7.4	6	6.3
With previous course of streptomycin	84	18	22.0	11	13.4	28	34.1	11	13.4	7	8.5
Cavernostomy											
Without previous course of streptomycin	24	1	4.2	1	4.2	1	4.2	0	0.0	0	0.0
With previous course of streptomycin	34	5	18.5	3	11.1	8	29.6	2	7.4	1	3.7
Decortication											
Without previous course of streptomycin	64	1	1.6	3	4.9	5	8.2	2	3.3	1	1.6
With previous course of streptomycin	30	0	0.0	1	4.3	7	30.4	2	8.7	0	0.0

* Includes empyemas and wound infections.

TABLE 2.—*Therapeutic Efficacy and Toxicity, Streptomycin and Dihydrostreptomycin*

	1.0 Gm. Streptomycin/90 Days: No.	1.0 Gm. Streptomycin/90 Days: Percentage	1.0 Gm. Dihydrostreptomycin/90 Days: No.	1.0 Gm. Dihydrostreptomycin/90 Days: Percentage	2.0 Gm. Dihydrostreptomycin/12 Days: No.	2.0 Gm. Dihydrostreptomycin/12 Days: Percentage
Therapeutic Efficacy						
Roentgen changes at end of treatment						
Total patients treated	129	100	34	100	..	.....
Marked or moderately improved	54	41.8	6	23.5	..	.....
Slight improvement	40	31.0	11	32.4	..	.....
Unchanged	27	20.9	11	32.4	..	.....
Worse	8	6.3	4	11.7	..	.....
Sputum conversions						
Patients undergoing sputum examinations	99	100	17	100	..	.....
Conversions	22	27.5	2	11.8	..	.....
Toxicity						
Vertigo						
Patients tested	183	100	61	100	57	100
Vertigo present	15	8.2	5	6.0	6	10.5
Ataxia						
Patients tested	107	100	48	100	40	100
Ataxia present	7	6.5	5	10.4	7	17.5
Caloric stimulation						
Patients tested	103	100	44	100	25	100
Diminished response	5	4.5	1	2.3	6	22.5
No response	1	1.0	0	0.0	1	2.5
Hearing loss						
Patients tested by audiometer	94	100	45	100	43	100
Loss by audiometer only	10	10.6	3	6.7	7	16.3
Loss by spoken voice or by spoken voice and audiometer	1	1.1	2	4.4	3	7.0

7. Minutes of the Sixth Veterans Administration-Army-Navy Streptomycin Conference, St. Paul, Oct. 21-24, 1948.

aminosalicylic acid. The data presented in table 2 and ancillary observations [4] suggest that, in equivalent daily dose (e. g., 1.0 Gm.), dihydrostreptomycin is somewhat inferior to streptomycin in point of therapeutic efficacy and that, although when examined by caloric tests it has less effect on the function of the vestibular nerve, when it is given in the larger daily dose of 2.0 Gm. (and certainly when given in still larger doses [8]) it may produce a loss of hearing during or even after the completion of treatment, which has rarely been observed with streptomycin. All in all, the investigators are dubious of the usefulness of dihydrostreptomycin and believe that as long as a daily dosage of 1.0 Gm. of streptomycin is considered adequate therapy the chief value of dihydrostreptomycin will be found in cases in which there is unusual susceptibility to the toxic manifestations of streptomycin or sensitivity phenomena.

Other new tuberculostatic drugs which had shown considerable promise in vitro were reported to the Streptomycin Conference of November 1949.[6] Neomycin, which Waksman had already discussed before a previous conference,[3] was regarded as still too toxic to justify clinical trial in the treatment of such a chronic disease as tuberculosis. It had not yet been possible to produce a sufficiently stable form of mycomycin to permit its clinical evaluation. The theory that a more adequate study of aureomycin might produce some evidence of therapeutic efficacy was exploded. Certain streptomycylamines had been found less effective than streptomycin in vitro.

THIOSEMICARBAZONES

Some thiosemicarbazones were reported to have pronounced tuberculostatic effects in experimental murine tuberculosis, and a summary of the experience with one of these (TB 1-698) in German clinics was presented. It appears that this substance is definitely less effective than streptomycin (being quite useless in tuberculous meningitis, for example) but that it exerts a tuberculostatic effect which is of the order of—and perhaps greater than—that of para-aminosalicylic acid. It may prove to be more toxic than either drug in its tendency to produce liver damage and blood dyscrasias. The conference decided to employ TB-1 in a careful pilot study, administering it alone and in combination with streptomycin. This study is now in progress.

PARA-AMINOSALICYLIC ACID

Of more present promise than the drugs mentioned in the preceding paragraph (excepting TB-1, of which it is premature to speak) is para-aminosalicylic acid (PAS). Para-aminosalicylic acid has been used to a considerable extent in the tuberculosis clinics of Sweden since 1946.[2] It has demonstrable tuberculostatic action both in vitro and in the experimental animal. Confidence in its effectiveness has not been sufficiently great to justify its administration to alternate patients in sequence with streptomycin, but it has been tried in the increasingly large group of patients whose tubercle bacilli have become resistant to streptomycin. Admittedly this group, which has been treated with streptomycin, developed resistance to it and then relapsed, may possess unusual characteristics, such as a subnormal degree of acquired immunity. However that may be, it is clear that they respond much less favorably to para-aminosalicylic acid than does the group with micro-organisms sensitive to streptomycin, which is treated by the latter drug. To take but a single example, only 8.2 per cent (of 56 cases) showed marked or moderate roentgenologic improvement with para-aminosalicylic acid as compared to 40.9 per cent (of 132 cases) with streptomycin.[6]

It seemed reasonable to think that the concomitant use of para-aminosalicylic acid and streptomycin might decrease the frequency with which tubercle bacilli become resistant to the latter, regardless of the mechanism (mutation or acquired tolerance) responsible for its development. This point was examined, in connection with both promizole[9] and para-aminosalicylic acid, in a study initiated during the summer of 1948. The results with promizole[9] and streptomycin were equivocal, and, although they do not appear promising, one should perhaps not express a final opinion on them. The results with para-aminosalicylic acid (12.0 Gm. perorally daily) and streptomycin (1.0 Gm. intramuscularly daily) or dihydrostreptomycin (in the same dosage) for 120 days are less equivocal and, although they require further confirmation, appear highly promising. Thirty-six cases have been followed for four months and a smaller number for as long as twelve months. In the absence of para-aminosalicylic acid, resistant bacilli develop in 80 per cent of the patients who continue to show positive cultures at the end of 120 days. In the presence of para-aminosalicylic acid, the incidence is reduced to a figure of the order of 30 per cent.[4] It will be recalled that one may accomplish a similar decrease in the incidence of resistance by abbreviating the duration of treatment to 42 days but only at the expense of a decrease in therapeutic efficacy. In the present instance, the efficacy of streptomycin (or dihydrostreptomycin) appears to be definitely increased by the addition of para-aminosalicylic acid.[4]

In contemplating the disadvantages of para-aminosalicylic acid one must admit that tubercle bacilli become resistant to it (the frequency of this occurrence is not yet established), that certain major skin eruptions may occur and that its administration is often accompanied with gross symptoms of gastrointestinal irritation—nausea, vomiting, anorexia and diarrhea—even when the drug is given as the sodium salt. In a pilot study conducted by three hospitals and reported at the conference of November 1949 [6] the use of enteric-coated capsules did not prove helpful in avoidance of these gastrointestinal disturbances. Another study employed a single daily injection of the para-aminosalicylic acid salt of streptomycin with the design of avoiding the irritant effects of orally administered para-aminosalicylic acid while supplying it in sufficient amounts (despite its small dose of 0.8 Gm. and its transient presence in the blood stream) to preserve its effect on streptomycin-resistant tubercle bacilli. The results are promising but do not yet justify any statement. It is impractical to administer para-aminosalicylic acid intravenously as a routine procedure, and, on theoretic grounds, it is difficult to support its use by this route except as an emergency procedure.

INTERRUPTED REGIMENS

One final procedure, for which Fitzsimons General Hospital has been largely responsible, has been the introduction of "interrupted" regimens under which 1 or 2 Gm. of streptomycin is given every third day for 120 days, or daily for four weeks followed by a "rest" period of four or six weeks and then a repetition of the course. The therapeutic efficacy of these regimens shows surprisingly little decrease—if, indeed, any decrease can be demonstrated—and the objective with which they were hopefully conceived, that of delaying the emergence of resistance, appears to have been achieved. There is still disagreement as to whether this undoubted delay in the emergence of resistance is accompanied with a decrease in its incidence. The study of these regimens is continuing.

SUMMARY

Hinshaw's demonstration that streptomycin was a potent and practicable chemotherapeutic agent in the treatment of clinical tuberculosis has been confirmed long since.[1a] It has been the task of the present investigation—and of many others—to define the limits of its usefulness and to investigate the means by which these limits could be extended. Many points have been studied; three of positive importance have emerged during the past two and one-half years—the period covered by this report and that of its predecessor [1b]: The importance of combining surgical procedures with chemotherapy has been recognized; the incidence of toxic manifestations has been decidedly reduced by the use of daily doses of 1.0 Gm. or less; the development of resistant micro-organisms has apparently been delayed and its incidence reduced by the concomitant administration of para-aminosalicylic acid.

Much remains to be done. The incidence of toxicity and resistance has been reduced, but neither one has been abolished; nothing is known of the optimum dose of para-aminosalicylic acid, and the most effective regimens for the various types of tuberculosis require further research, for it is almost certain that the conception of a single optimum regimen—which has been employed in this study—is faulty. Streptomycin is not a "cure" for tuberculosis, but some progress has been made along a good road in its study. An organization has been developed which can be directed promptly and with some precision to an investigation of the newer means of chemotherapy which are certain to develop.

8. Footnotes 3 and 6.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION
535 NORTH DEARBORN STREET - - - CHICAGO 10, ILL.

Edited by
AUSTIN SMITH, M.D.

Associate Editor
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Editor for Current Medical Literature, GEORGE HALPERIN, M.D.

Subscription price - - - - Twelve dollars per annum in advance

Cable Address - - - - "Medic, Chicago"

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SATURDAY, MARCH 4, 1950

STREPTOMYCIN IN THE TREATMENT OF TUBERCULOSIS

The therapeutic efficacy of streptomycin in the treatment of tuberculosis is limited principally by two factors, toxicity and the emergency of bacterial resistance. Riggins and Hinshaw [1] pointed out in their report on a cooperative study of 332 patients with pulmonary tuberculosis that administration of relatively high daily doses of 2 or 3 Gm. of streptomycin frequently resulted in the emergence of drug-fast organisms and severe toxic manifestations, the most serious being deafness and loss of labyrinthine function.

Elsewhere in this issue,[2] the Streptomycin Committee of the Veterans Administration has submitted its third report to the Council on Pharmacy and Chemistry dealing with the present status of the chemotherapy of tuberculosis. This report is based on the results of treatment of approximately 7,000 patients with all types of tuberculosis by twenty-two different regimens.

In another recent report on this cooperative study of the Veterans Administration, Army and Navy, embracing some 4,500 cases of tuberculosis, including 2,000 cases of pulmonary tuberculosis, Tucker [3] dealt particularly with the effects of different streptomycin regimens with respect to toxicity of the antibiotic, the rate of emergence of resistant strains of Mycobacterium tuberculosis and the therapeutic result. The primary purpose of the study was to investigate the effects of a relatively restricted number of variables, limited particularly to variations in dosage and duration of therapy. This was made possible by access through the cooperating Study Units to a large volume of clinical data, selected, treated and reported under uniform conditions. The criteria employed in the evaluation of different regimens were those of clinical signs, roentgenographic observation during the period of treatment, relapse by roentgenographic observation during the poststreptomycin observation period, sputum conversion at various points in time and the mortality experience to date. The emergence of streptomycin-resistant strains of tubercle bacilli constitutes one of the most important limiting factors in such chemotherapy. The inability of streptomycin to have a favorable influence on lesions with a large necrotic component is another. It has been definitely established by several investigators that the subacute forms of pulmonary tuberculosis respond to streptomycin approximately as well as do the acute, and that even in the chronic forms some improvement may occur. Relapse is more likely to take place in the most chronic stages of the disease than in the more acute stages, and it is therefore important to combine streptomycin therapy with other procedures such as collapse and excisional therapy.

The results of the investigations reported by Tucker, although limited in character, have indicated that streptomycin therapy of longer duration in both pulmonary and extrapulmonary lesions is superior to that of shorter duration and that a daily dose of 2.0 Gm. is superior to a daily dose of 1.0 Gm. However, the slightly superior clinical results of the larger dose are offset by the greater toxicity, especially if therapy is long continued. The experience with dihydrostreptomycin was limited to only 56 patients and to a period of time too short to permit definite conclusions. The data for the rates of emergence of resistant organisms indicate definitely that administration of streptomycin daily for long periods, up to three or four months, and not in combination with other tuberculostatic drugs, results in a high percentage of drug-resistant micro-organisms. The difference in clinical response between treatment with 2.0 Gm. a day and with 1.0 Gm. a day is slight. The difference in therapeutic response between treatment with 1.0 Gm. a day and with 0.5 Gm. a day is greater. Reducing the daily dosage of streptomycin from 2.0 to 1.0 Gm. has successively lowered the incidence of all important toxic manifestations. Reducing the duration of administration of the drug from 120 days to 60 or 42 days likewise lowered the toxicity. Some decreased incidence of toxicity followed the reduction of the number of injections into which the total daily dosage is divided. Dihydrostreptomycin appeared to be less toxic than streptomycin with respect to disturbance of vestibular function but not otherwise significantly different in toxicity from streptomycin. Strains of tubercle bacilli resistant to 10 micrograms per cubic centimeter or more of streptomycin emerged at a fairly regular rate, which appeared to be independent of daily dosage but definitely related to duration of therapy. At the end of 42 days of daily administration, approximately 35 per cent of specimens examined were resistant to 10 micrograms per cubic centimeter

1. Riggins, H. M., and Hinshaw, H. C.: Streptomycin-Tuberculosis Research Project of the American Trudeau Society: A Summary Report, Am. Rev. Tubere. 59: 140-167 (Feb.) 1949.

2. Streptomycin Committee of the Veterans Administration: Current Status of the Chemotherapy of Tuberculosis in Man. Report to the Council on Pharmacy and Chemistry, J. A. M. A. 142: 650 (March 4) 1950.

3. Tucker, W. B.: Evaluation of Streptomycin Regimens in the Treatment of Tuberculosis: An Account of the Study of the Veterans Administration, Army, and Navy, July 1946 to April 1949, Am. Rev. Tubere. 60: 715-754 (Dec.) 1949.

or more; at the end of 60 days, 50 per cent; at the end of 120 days, 75 per cent. Administration of streptomycin every third day instead of daily resulted in rates of emergence of resistant strains of approximately one third of these figures. Combined therapy with para-aminosalicylic acid added to streptomycin had the effect of reducing the rates of emergence of resistant strains still further. Relapse rates were only slightly higher for patients treated with 1.0 Gm. a day for 42 days, or 0.5 Gm. a day for 120 days or 42 days. Mortality rate was only slightly greater for the patients treated for 42 days and those treated with 0.5 Gm. a day for 120 days. Thirty per cent of patients with miliary tuberculosis survived eighteen months or more after the start of therapy; 10 per cent or less of patients with tuberculous meningitis with or without miliary tuberculosis survived eighteen months or more.

The current report to the Council on Pharmacy and Chemistry deals with data obtained since the preparation of the Tucker report. Although Tucker's conclusions are fully substantiated by these later data, the results with concomitant use of streptomycin and para-aminosalicylic acid continue to be encouraging. In the absence of para-aminosalicylic acid, resistant bacilli develop in 80 per cent of the patients who continue to show positive cultures at the end of 120 days. In 36 patients treated with streptomycin and para-aminosalicylic acid and followed for four to twelve months, the incidence of resistant bacilli was only 30 per cent.

Apparently the one "best" streptomycin regimen has not yet been determined. One gram a day appears to be a satisfactory daily dosage. The duration of therapy, the spacing of single administration and the combination with other chemotherapeutic agents, such as para-aminosalicylic acid, with tuberculostatic properties have not been definitely evaluated. Because of the limitations imposed on streptomycin therapy by the phenomenon of drug resistance, duration of therapy should generally not exceed 42 or 60 days until procedures designed for delaying the emergence of streptomycin-resistant strains of tubercle bacilli have been standardized.

The data presented demonstrate superiority of streptomycin regimens of longer duration and high daily dosages, which at present, however, cannot be adhered to because of limitations of toxicity and drug resistance. It is possible that the combined streptomycin–para-aminosalicylic acid therapy and the administration of streptomycin at intervals of three days may result in reduction of the limitations of drug fastness.

In view of the many remaining problems in the streptomycin therapy of tuberculosis, results of the present investigation must be regarded as preliminary and restricted in their significance. Until these problems have been resolved, the regimens currently recommended by the Veterans Administration should be used as a guide to the chemotherapy of tuberculosis.

RETIRED PAY FOR RESERVE OFFICERS

Some members of the reserve components of the Armed Services are not familiar with the retirement benefits to which they are entitled by law. Public Law 810 of the Eightieth Congress states that any reserve officer or enlisted man who has performed satisfactory federal service for an aggregate of twenty years, the last eight of which have been as a member of a reserve component, is eligible for retirement pay on reaching the age of 60. The amount of such pay is proportionate to the highest rank satisfactorily held and to the relative number of years of active and inactive service.

The term "Federal Service" as used includes all active federal service in the United States Army, Air Force, federally recognized National Guard prior to 1933, Navy, Marine Corps, Coast Guard and all service in their reserve components other than active federal service performed prior to July 1, 1949, except for service in the inactive National Guard or Air National Guard, in a nonfederally recognized status in the National Guard or Air National Guard or in an inactive reserve section of the Officers' Reserve Corps or an inactive officers' section of the Air Force Reserve. The term "active federal service" includes all periods of annual training duty, all prescribed periods of attendance at service schools and any period of active duty under orders of competent federal authority. In other words, each year of satisfactory service prior to July 1, 1949 is considered to be a year of satisfactory federal service without any retroactive requirement as to the duties which must have been performed, provided that this service was not performed in certain inactive components which are specifically excluded. This law states that no one who was a member of a reserve component on or before Aug. 13, 1945 shall be eligible for retirement benefits under its provisions unless he has performed active federal service during any portion of either of the two periods April 6, 1917 to Nov. 11, 1918 and Sept. 9, 1940 to Dec. 31, 1946.

Subsequent to July 1, 1949, however, a year of satisfactory federal service as a member of a reserve component while not on active duty consists of any year during which a minimum of fifty points has been credited on the following basis: (1) fifteen points, automatically granted for membership in the active reserve; (2) one point for each day of active federal service during that year; (3) one point for each drill, meeting, instruction period and performance of physical examinations and for each day of training duty, with or without pay, and (4) various point credits for the successful completion of correspondence courses.

The retirement pay granted under this law equals the sum derived by multiplying 2.5 per cent of the base and longevity pay which the recipient would receive if he were serving on active duty, at the time he is granted such pay, in the highest temporary or permanent grade which he held satisfactorily during his entire

period of service, by a certain factor. This factor consists of the number of years and any fraction thereof (on the basis of 360 days per year) composing the sum of the following: (1) all periods of active federal service; (2) fifty days for each year of federal service, other than active federal service, performed as a member of a reserve component prior to July 1, 1949, and (3) one day for each of the fifty points required for each year of satisfactory service performed subsequent to July 1, 1949. Not more than sixty days may actually be credited, on this basis, per year. Anyone who has not attained the age of 60 but is eligible in all other respects to receive retirement pay under the provisions of this law may be transferred to an inactive status.

Suppose that a physician served as a reserve officer for the ten year period ending Jan. 1, 1940. He will thus have accumulated 10 times 50, or 500 "days" during this time. Called to active duty on Jan. 1, 1940, he served five years, until Jan. 1, 1946, at which time he was released from active duty with the rank of colonel or its equivalent and 5 times 360, or 1,800 additional days. Remaining in his reserve component, he accumulates 3½ times 50, or 175 additional days during the three and one-half year period between Jan. 1, 1946 and July 1, 1949. He now has eighteen and one-half years of satisfactory federal service and needs only one and one-half more years of service to qualify for the retirement benefits under Public Law 810. To do this he must be credited with the fifty points a year required, since July 1, 1949, for a year of satisfactory federal service. Should he do this by remaining active in the reserve program, he will receive an additional 75 (1½ times 50) days, giving him a total of 2,550 days of service over his twenty year period of federal service. At the age of sixty he will be entitled to receive 2.5 per cent of $612.75, the base pay of a colonel with twenty years of service, times 7.1 (2,550 divided by 360), or $108.77 monthly, for the remainder of his life. Should he not be credited with the necessary fifty points by July 1, 1950, however, and since he may conceivably be discharged for disability during the extra year that would then be required for him to earn these fifty points, he may have forfeited the equivalent of an annuity for which he has already almost completed payment.

Some younger men, unknowingly, may also be forfeiting a sum already paid by them for a similar annuity. Suppose a physician has served for one year in a reserve component and then for three years of active duty during the war, after which he has let his commission lapse. He is credited with four years of federal service, and, because of his youth, still has available to him the necessary time in which to serve the sixteen additional years required of him. He is probably still young enough, despite the three to four year period that he has been inactive, to serve the required sixteen years and revert to an inactive status before the age of 60. Since he may retire with the rank of colonel or its equivalent, he will, even though he has not served on active duty a single day during this time, be entitled to $88.86 monthly for the remainder of his life. Should he elect to serve for additional periods of active duty the amount to which he would be entitled would, of course, be greater.

Current Comment

ENZYMATIC OXIDATION OF FATTY ACIDS

Almost fifty years ago, Knoop [1] published his theory that fatty acids are oxidized in the body at the beta carbon atom. From a chemical viewpoint this should result ultimately in the appearance of acetic acid or a simple derivative of it, such as acetoacetic acid or acetone. The discovery by Embden [2] that acetone is formed in the liver added support to the theory of beta-oxidation. The current concept [3] is that the fatty acid molecule is disrupted into 2-carbon fragments by simultaneous, multiple alternate oxidation and that these fragments then condense to form acetone as observed in the clinic and in the laboratory. The mechanism for the foregoing changes involves various enzyme systems. In 1943, Muñoz and Leloir [4] showed that several fatty acids could be oxidized by an enzyme preparation from guinea pig liver, provided adenylic acid, phosphate, cytochrome and magnesium ions are present in the system. These observations were extended by Lehninger,[5] who demonstrated that carefully prepared liver suspensions require adenosine pyrophosphate, magnesium ions, cytochrome and coenzyme I to oxidize fatty acids to acetoacetic acid; if, in addition, a polycarboxylic acid such as fumaric or oxalacetic is present, the oxidation proceeds further toward completion by way of the tricarboxylic acid cycle. Heart muscle, in contrast to liver, carries the oxidation to the more complete stage. Microdissection of liver cells led to the conclusion that the enzyme system responsible for the oxidation resides in the mitochondria.[6] The contrast between the difficult laboratory oxidation of fats and their smooth oxidation in the organisms has long been known. Moreover, the high yield of energy (9 calories per gram) when fat is oxidized has traditionally proved useful in clinical dietetics. The modern aspects of this oxidation, however, include a complicated set of enzyme reactions, in the course of which dehydrogenation occurs coupled with esterification of phosphate,[7] and the energy stored in this high energy phosphate bond is then ready for distribution for vital action in a variety of ways. As further investigation is carried out, the final common pathway of the metabolism of all three major foods becomes more apparent.

1. Knoop, F.: Beitr. z. Chem. Phys. u. Path. 6: 150, 1904.
2. Embden, G., and Engel, H.: Beitr. z. Chem. Phys. u. Path. 11: 323, 1908.
3. Weinhouse, S.; Medes, G., and Floyd, N. F.: J. Biol. Chem. 155: 143, 1944.
4. Muñoz, J. M., and Leloir, L. F.: J. Biol. Chem. 147: 355, 1943.
5. Lehninger, A. L.: J. Biol. Chem. 164: 291, 1946; 165: 131, 1946.
6. Kennedy, E. P., and Lehninger, A. L.: J. Biol. Chem. 179: 957, 1948.
7. Friedkin, M., and Lehninger, A. L.: J. Biol. Chem. 178: 611, 1949.

ORGANIZATION SECTION

Washington Letter

(From a Special Correspondent)

Feb. 27, 1950.

Medical Leaders Will Testify on Social Security

The Senate Committee on Finance has announced that it plans to terminate on March 24 the public hearings on amendment of the Social Security Act that were begun a few weeks after opening of the present session of Congress in January. Scheduled to testify on February 28 are: Dr. James E. Paullin, Atlanta, Ga.; Dr. R. L. Sensenich, South Bend, Ind.; Dr. Gunnar Gundersen, La Crosse, Wis., and Dr. Bradford Murphy, Denver. Witnesses in March will include spokesmen for the American Federation of Labor, U. S. Chamber of Commerce, several insurance companies, various industries and certain business groups.

Truman Urges Extension of Employees' Health Program

President Truman has issued a policy statement to all federal agencies, in the field as well as in the Capital, recommending establishment of federal employee health programs by all that have not already done so. The U. S. Public Health Service acts as the advisory body in initiation and maintenance of the programs, which call for provision of health rooms, treatment of on-the-job illnesses, health counseling, preemployment physical examinations and fulfilment of certain other responsibilities.

Appeal for Special Aid to Alaska

An appeal for Congressional enactment of bill H. J. Res. 403, authorizing special emergency assistance to Alaska for extension of maternal and child health, public assistance and vocational rehabilitation services, was made February 10 by Dr. C. Earl Albrecht, Territorial Commissioner of Health. He presented his testimony to the House Public Lands Committee. Asked by a committee member whether H. J. Res. 403 might not be construed as a step toward "socialized medicine," Dr. Albrecht replied that the resolution would simply increase financial assistance for projects already approved and under way.

Pathology Building Project Approved by Committee

A bill (H. R. 6539) authorizing construction of a new building to house the Armed Forces Institute of Pathology, successor to Army Institute of Pathology, was approved on February 13 by the House Armed Services Committee and forwarded to the floor for action. The measure authorizes appropriation of $350,000 for architectural plans, specifying that the project shall be built on the Army Medical Center reservation in Washington.

The committee's printed report stated that 75 per cent of the institute's services are performed for the military and Veterans Administration medical departments and the remainder for civilian pathologists and institutions throughout the country. "Civilian pathologists," said the report, "are making a real contribution to the growth and success of the present Armed Forces Pathology Institute in that they forward rare specimens for inclusion in the Army collection. The Deputy Surgeon General of the Army has stated that it is his firm conviction that the contributions made by civilian pathologists are at least of equal value to the services performed for them by the Armed Forces Institute. Incidentally, the establishment of this institute within the armed forces has the very strong recommendation and support of the civilian medical profession."

Beds for Veterans in Texas

Two Texas representatives in Congress, Lloyd M. Bentsen Jr. and John E. Lyle Jr., have introduced identical bills designed in effect to convert the Corpus Christi, Texas, Naval Hospital into a veterans hospital. (Early in February, the Department of Defense announced that the institution must be reduced in size to one hundred operating beds, as far as military patients are concerned, no later than June 30 of this year.) Concerned by the lack of hospital beds for veterans in the southern part of Texas, the two Democratic representatives are attempting to have all beds which are declared surplus by the Department of Defense transferred to the Veterans Administration for staffing and maintenance.

Award of a $10,563,000 contract for construction by the Veterans Administration of a new 1,000 bed general medical and surgical hospital in Boston was announced February 16. A separate contract of $550,211 for installation of elevators was awarded at the same time.

During 1950, twenty-six new veterans hospitals and six major additions to existing plants are scheduled for completion. They will provide approximately 11,710 beds. Since January 1 contracts have been let for a 900 bed institution at West Haven, Conn., and a 350 bed addition at Minneapolis, as well as for the Boston project.

Extension of Federal Medical Benefits Urged

Testifying February 13 on proposed amendments to the Social Security Act, John Hayes, superintendent of Lenox Hill Hospital (New York) and chairman of the Council on Government Relations, American Hospital Association, recommended that state agencies be authorized to buy medical and hospital care for persons on relief.

"We believe that the services of Blue Cross and Blue Shield prepayment plans should be utilized in providing the proper distribution of medical and hospital care to relief recipients," Hayes testified before the Senate Finance Committee. "The American Hospital Association believes that the voluntary health insurance plans can be used by government in meeting its fundamental obligation for the care of persons unable to provide for themselves."

Funds Sought for Air Pollution Study

A House Joint Resolution (no. 416) which directs the U. S. Public Health Service to conduct an intensive investigation into health hazards of air pollution was introduced in Congress February 8 by Representative James J. Murphy (Democrat, New York). The measure, specifying that the study shall be completed within three years, authorizes appropriation of $500,000 for the first year "and such sums for subsequent years as may be necessary to complete such program." It points out that since publication of the public health service's report on the Donora, Pa., incident, in which 20 deaths were attributed to atmospheric contamination, twenty-five cities and regions have applied to Washington for institution of air pollution investigations.

Vocational Rehabilitation of Cardiac Patients

Between 1943 and 1949 a total of 11,314 persons handicapped by heart ailments were conditioned for and placed in jobs enabling them to earn their own living, according to a government statement issued in connection with observance of National Heart Week. Michael J. Shortley, director of the Office of Vocational Rehabilitation (Federal Security Agency), explained that most of the 11,314 persons were unemployed at the time they requested assistance from rehabilitation agencies in their home states. In 1949 almost 2,300 of these cases were handled.

"Vim Herb" Curbed by Federal Trade Commission

The Federal Trade Commission has ordered A. P. Durham, trading as Herb Products Co., Anderson, S. C., to stop advertising its product "vim herb" as a cure or remedy for constipation. The order was issued following admission by Durham of all material allegations contained in the FTC complaint. His product was described by the commission as a mixture of ordinary irritant laxatives and bitter ingredients in a sugar-sweetened, volatile oil-flavored vehicle of water and alcohol.

Medical Legislation

STATE LEGISLATION

Georgia

Bill Introduced.—H. 589 proposes that applicants for a license from the State Board of Medical Examiners must present a certificate showing that such applicant has completed a one year rotating internship in a hospital and that during said internship the applicant has had experience in surgery, medicine, obstetrics, gynecology and pediatrics. The State Board of Medical Examiners, under this proposal, would be authorized and empowered to approve and designate hospitals in the state of Georgia and outside of the state as being satisfactory hospitals for such internship.

Idaho

Bills Introduced.—H. 4-X and H. 42-X propose to amend the law relating to the establishment of a State Board of Examiners by requiring that such board shall be composed of five persons who are qualified in either medicine and/or psychiatry and who shall be appointed by the governor, with the advice and consent of the senate. Operations performed on persons by the consent of the person involved must be performed by or under the direction of a surgeon specially designated for each case by the board.

Kentucky

Bills Introduced.—H. 262 proposes to make it unlawful for any person to possess, manufacture, sell, dispense, prescribe or administer any barbiturate except from a licensed pharmacist on prescription of a practitioner. A practitioner is defined to mean a person licensed under the professional licensing laws of the state to prescribe and administer medicines. H. 272 proposes regulations for the licensing of practical nurses and for the approval of schools of practical nursing. H. 273 proposes regulations for the licensing and regulation of professional nursing and the approval of schools of professional nursing. H. 295, to amend the medical practice act, proposes that any person who has been engaged in the practice of medicine for forty or more years and who presents affidavits from two reputable licensed members of the medical profession practicing in the same general locality and knowing of his professional qualifications and stating that he is qualified to be a member of the medical profession, shall on application be entitled to a license.

Massachusetts

Bills Introduced.—S. 286 proposes that all school employees shall be examined for tuberculosis by a registered physician and shall present a certificate at least every three years showing freedom from such disease. S. 297 proposes that the board of health shall cause every child in the public schools to be separately and carefully examined to ascertain defects in sight or hearing and other physical defects tending to prevent his receiving the full benefit of his school work.

Mississippi

Bills Introduced.—H. 527 proposes regulations for the examination, licensure and regulation of practical nurses. H. 547 proposes to authorize inhabitants of the state of the age of 21 years or more, of sound mind, by an instrument in writing executed as a deed and filed in the office of the circuit judge, to arrange for or prescribe for the disposition to be made, after death, of his body or any organ, member or part thereof, provided the disposition of said body or parts thereof is made for the purpose of advancement of medical science or for the replacement of diseased or worn out parts of other human beings, or for the rehabilitation of human parts or other organs. H. 553 proposes, among other things, that the witness fees for expert witnesses shall be fixed by the court and that not less than $25 or more than $100 for each case shall be paid as fees for such witnesses. An expert witness is considered by this proposal to be any witness held by the court to be competent to give testimony as to the medical, scientific or technical meaning and significance of the facts and exhibits offered in evidence, where such medical, scientific or technical meaning and significance are admissible under the rules of evidence prevailing in the state as contradistinguished from the existence or nonexistence of said facts and as admeasured by the principles of the pertinent science, whether medicine, surgery, chemistry, ballistics, finger printing or any other branch of technical learning, knowledge or skill that might be generally classified as a science. S. 410 proposes to authorize county superintendents of education and boards of trustees of municipal school districts to expend funds to defray the expenses of health education programs in the public schools.

New York

Bills Introduced.—A. Res. 139 proposes to memorialize the Congress of the United States to enact legislation to provide federal funds for research in multiple sclerosis. A. 1652 proposes the establishment of minimum standards for the staffs of state mental hospitals. A. 1662 and S. 1335, to amend the law relating to physiotherapy, proposes to exempt from the provisions of the act the administration of physiotherapy and/or the use of physiotherapy modalities by a licensed and registered physiotherapist when not for the treatment of any human disease, pain, injury, deformity or physical condition and also the administration of physiotherapy by a duly licensed and registered physiotherapist on the oral prescription of a duly licensed and registered physician. A. 1717, to amend the education law, proposes to make x-ray diagnosis, x-ray treatment and radium treatment the practice of medicine. A. 1773 and A. 1774, to amend the judiciary law, propose to exempt podiatrists from jury duty. A. 2062 proposes the creation of a state commission to make a comprehensive study and survey of the causes and effects of heart disease, rheumatic fever, rheumatic heart and kindred or related diseases. A. 2040, to amend the civil practice act, proposes that the testimony of a physician, psychologist, psychiatrist or other person concerning the mental state of a party to an action or a witness therein, not personally examined by him, in a professional capacity, shall be inadmissible in evidence. A. 2139, to amend the judiciary law, proposes to exempt chiropractors from jury duty. S. 1393, to amend the penal law, proposes to authorize an adult child, parent, brother or sister of the deceased or any person authorized in writing to do so by the decedent during his lifetime to authorize dissection of the deceased for the sole purpose of ascertaining the cause of death. This proposal is only effective if there is no surviving husband or wife to grant the authority. S. 1461, to amend the education law, proposes that every prescription issued by a physician calling for a patent medicine or any other medicine or drug which is sold or available for sale under a well known trade mark or trade name shall be written solely and exclusively in the English language and shall designate the article by its trade name. S. 1518, to amend the mental hygiene law, proposes the creation of a state rehabilitation bureau for alcoholic addicts. S. 1583, to amend the penal law, proposes to require a physician in attendance at birth to cause the footprints of the child and the thumb prints of the mother to be immediately taken. S. 1702, to amend the public health law, proposes to require every physician attending a pregnant woman to make an Rh test as well as a test for syphilis. S. 1746 proposes the appointment of a commission to initiate intensive programs of intensive and continuing medical research in an unremitting effort to find a cure for the diseases of cancer and poliomyelitis and from time to time to make reports and recommendations concerning such studies and research.

Coming Medical Meetings

Alabama, Medical Association of the State of, Birmingham, April 20-22. Dr. Douglas L. Cannon, 519 Dexter Ave., Montgomery, Secretary.

American Academy of Allergy, Los Angeles, Hotel Biltmore, March 6-8. Dr. Theodore L. Squier, 268 E. Wisconsin Ave., Milwaukee 2, Secretary.

American Academy of Neurology, Cincinnati, Netherlands-Plaza Hotel, April 14-15. Dr. Joe R. Brown, Mayo Clinic, Rochester, Minn., Secretary.

American Association for Thoracic Surgery, Denver, Colo., April 15-19. Dr. Brian Blades, 901 Twenty-Third St. N.W., Washington, D. C., Secretary.

American Association of Anatomists, New Orleans, Louisiana State University, April 3-5. Dr. Normand L. Hoerr, 2109 Adelbert Road, Cleveland 6, Secretary.

American Association of Pathologists and Bacteriologists, Madison, Wis., April 14-15. Dr. Alan R. Moritz, 2085 Adelbert Road, Cleveland 6, Secretary.

American Association of Railway Surgeons, Chicago, Drake Hotel, April 4-6. Dr. Chester C. Guy, 5800 Stony Island Ave., Chicago 37, Secretary.

American College of Physicians, Boston, April 17-21. Dr. George Morris Piersol, 4200 Pine St., Philadelphia, Secretary General.

American Goiter Association, Houston, Texas, March 9-11. Dr. George C. Shivers, 100 E. St. Vrain St., Colorado Springs, Colo., Secretary.

American Physiological Society, Atlantic City, April 17-21. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Executive Secretary.

American Society for Experimental Pathology, Atlantic City, April 11. Dr. Sidney C. Madden, Brookhaven National Laboratory, Upton, L. I., New York, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Atlantic City, April 17-21. Dr. Harvey B. Haag, Medical College of Virginia, Richmond 19, Secretary.

American Society of Biological Chemists, Atlantic City, April 9-14. Dr. R. W. Jackson, 825 N. University St., Peoria 5, Ill., Secretary.

American Surgical Association, Colorado Springs, Colo., April 19-23. Dr. Nathan Womack, University Hospitals, Iowa City, Iowa, Secretary.

American Therapeutic Society, Boston, April 13-16. Dr. Oscar B. Hunter, 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

Arkansas Medical Society, Fort Smith, April 17-19. Dr. William R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Dallas Southern Clinical Society, Dallas, Texas, March 13-16. Miss Betty Elmer, 1133 Medical Arts Bldg., Dallas 1, Executive Secretary.

Federation of American Societies for Experimental Biology, Atlantic City, April 17-21. Dr. Milton O. Lee, 2101 Constitution Ave., Washington 25, D. C., Secretary.

Georgia, Medical Association of, Macon, Hotel Dempsey, April 18-21. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Michigan Postgraduate Clinical Institute, Detroit, Book-Cadillac Hotel, March 8-10. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing 8, Secretary.

Mid-Atlantic Section, American Urological Association, Hot Springs, Va., The Homestead, March 23-25. Dr. H. N. Dorman, 1025 Connecticut Ave. N.W., Washington 6, D. C.

Missouri State Medical Association, St. Louis, March 26-29. Dr. H. E. Petersen, 634 N. Grand Blvd., St. Louis 3, Secretary.

National Society for the Prevention of Blindness, Miami, Fla., Hotel Floridian, March 29-30. Dr. Frankin M. Foote, 1790 Broadway, New York 19, Executive Director.

New Orleans Graduate Medical Assembly, New Orleans, Municipal Auditorium, March 6-9. Dr. Woodard D. Beacham, 1430 Tulane Ave., New Orleans, Secretary.

Northern Tri-State Medical Association, Grand Rapids, Mich., April 11. Dr. William H. Gordon, 1533 Woodward Ave., Detroit, Secretary.

Southeastern Surgical Congress, Washington, D. C., March 6-9. Dr. Benjamin T. Beasley, 45 Edgewood Ave. S.E., Atlanta 3, Ga., Secretary.

Tennessee State Medical Association, Memphis, April 10-12. Dr. W. M. Hardy, 706 Church St., Nashville 3, Secretary.

V 14
1950

GOVERNMENT SERVICES

NAVY

VOLUNTEERS FOR DUTY AT LEPER COLONY

Lieut. (jg) Gordon C. McNeilly (MC), U. S. Naval Reserve, of Utica, Ill., is being recalled to active duty at his own request for duty as officer in charge of the Provisional Leper Colony of the Trust Territories of the Pacific, Tinian Island, the Marianas. Dr. McNeilly is expected to arrive on Tinian about May 1 with his wife and two children. Before departure he will receive special training at the National Leprosarium, U. S. Marine Hospital, Carville, La., and at the Territorial Leprosarium, Molokai Island, Hawaii. For two and one-half years Dr. McNeilly has been serving a residency at the Sonoma County Hospital, Santa Rosa, Calif.

The Tinian Leprosarium, established to provide modern treatment for leprous patients from the islands of the Trust Territory, has been in operation since Sept. 7, 1948. The institution now cares for about 100 patients.

The leprosarium has a 24 bed dispensary, laboratories, seventy-nine small, individual houses, kitchens, power plant and water system, laundry, repair shops, church, fishing and farming equipment, quarters for the staff and a school for the children. The staff consists of one Naval medical officer, one warrant officer, four hospital corpsmen, three locally trained native nurses and two native male aides.

Dr. McNeilly will relieve Lieut. (jg) Jack W. Millar (MC), U. S. N., of Palo Alto, Calif., who was the first Naval medical officer assigned to the Leper Colony. Lieutenant Millar is being assigned to the Harvard University School of Public Health, specializing in tropical public health.

SANITARY FOOD HANDLING

A panel discussion to formulate plans for training Navy food handlers was held February 3 at the Naval Receiving Station, Washington, D. C. This was the first such meeting in a Navy-wide training and educational program to improve sanitary methods of handling food at naval messes, exchanges, clubs and cafeterias. The aims of this meeting were to establish a standardized training course for instructors, supervisors, exchange and commissary officers and to arrange the schedule of classes for this course, which is expected to be the prototype of similar courses held throughout the Navy. Rear Admiral H. L. Pugh, assistant chief, Bureau of Medicine and Surgery, presented the need for a Navywide food handlers program; other speakers were Lieut. F. E. Stewart (MSC), U.S.N., of the Preventive Medicine Division, Bureau of Medicine and Surgery; Mr. H. T. Weigel, Educational Specialist, Milk and Food Branch, U. S. Public Health Service; Mr. Roy B. Colbert, Office of Industrial Relations, Navy Department; Mr. Glenn Smitley, Economics Research Laboratory; Miss Mary N. O'Donnell, sanitarian for Government Services, Inc., cafeterias. Conferences are also being planned for various other Naval Districts in the near future.

DUTY UNDER INSTRUCTION

The following medical officers have been nominated for duty under instruction under the Navy's Graduate Training Program:

Comdr. Wesley Fry, to a fellowship in thoracic surgery, University of Michigan, Ann Arbor, Mich. Comdr. Herbert Wilson Jr., to a residency in pathology, Naval Hospital, San Diego, Calif. Lieut. Walter H. Harvis Jr., to a residency in radiology, Naval Hospital, Bethesda, Md. Lieut. Donald W. Robinson, to a residency in surgery, Naval Hospital, Great Lakes, Ill. Lieut. Mervyn J. Sullivan, to a residency in obstetrics and gynecology, Naval Hospital, Bethesda, Md. Lieut. (jg) Harry K. Wieman, to a residency in internal medicine, Naval Hospital, Chelsea, Mass.

PERSONALS

Capt. Melville J. Aston (MC), Commanding Officer, Naval Medical School, Bethesda, Md., spoke on "The Atomic Bomb Versus Survival" at the Atlanta (Ga.) Graduate Medical Assembly sponsored by the Fulton County Medical Society, February 6.——Comdr. John C. McNerney (MC) has recently been certified by the American Board of Neurological Surgery.

Capt. G. C. Daughtridge (MC), U.S.N., of Rocky Mount, N. C., was recently certified in roentgenology by the American Board of Radiology.

The following reserve medical officers have been recalled to active duty at their own request: Lieut. (jg) Albert F. Degner, to the Naval Air Station, Memphis, Tenn., and Lieut. (jg) William F. Taylor, to the Naval Hospital, Chelsea, Mass.

The following medical officers have been certified in psychiatry by the American Board of Psychiatry and Neurology: Capt. Stephen M. Smith (MC, USN), Comdr. Bernard I. Kahn (MC, USN) and Comdr. Felix H. Ocko (MC, USN).

VETERANS ADMINISTRATION

RESOLUTION OF COUNCIL OF PSYCHIATRIC ASSOCIATION

The president of the American Psychiatric Association, Dr. George S. Stevenson, New York, has released the following resolution passed by the governing council of the association:

"RESOLVED, that the Council of the American Psychiatric Association express its grave concern that measures advanced in the name of economy, but indefensible on scientific or humane grounds, now threaten the quality of service to veterans in need of neurologic and psychiatric care. New hospital construction without competent personnel will not provide adequate care for sick human beings. Current demands that additional hospitals, 16,000 beds (7,000 neuropsychiatric), be constructed beyond the availability of professional personnel in places away from medical centers and in the face of present trends of reduction of personnel ceilings and lowered financial appropriations must result in a deterioration of good medical care to the veteran. Nor is it economical to reduce the efficiency of existing hospitals by removing the consultants in the field as is now occurring with the reduction in force of administrative and supervisory personnel which is going on. Such types of so-called economy not only reduce the efficiency of patient care but interfere with the high standard of training in effect in the best Veterans Administration hospitals to provide physicians for the future.

"The recruitment, training and compensation of doctors in the psychiatric and neurologic service of the Veterans Administration is in sharp competition with the demands and rewards for professional services in civilian life, where the economy of early diagnosis and prompt care of neuropsychiatric patients is increasingly realized. Unless the Veterans Administration—and behind it the Congress and the voters—is prepared to recognize the value of well administered programs and the direct as well as the long term economy of early diagnosis and appropriate care, the public might well stand advised that inefficiency, frustration and general deteriorations in the neuropsychiatric care of veterans will rapidly set in.

"Examples of situations where we feel circumstances militating against the best interest of the disabled and sick veteran have occurred or are to take place:

1. Elimination of Branch offices; thus reducing supervision at the field level; with danger of further restrictions.
2. Decrease in funds for travel and consultation; thus cutting down the frequency, availability and quality of medical supervision.
3. Continued construction of hospitals in isolated areas; thus resulting in staffing problems, forced transfer of physicians to these hospitals, secondary resignations and disturbed morale.
4. Proposed cut for outpatient clinic care will result in increased hospitalizations and decreased care in the community.
5. Lay executive officers have become assistant managers, i. e., acting managers in the absence of managers; thus the very real danger exists of medically untrained nonprofessional personnel assuming control of the care of sick veterans."

COST OF BENEFITS TO VETERANS

The Veterans Administration has released figures for the estimated expenditures of a total of $6,687,495,447 paid out in benefits to veterans, their dependents or beneficiaries during the fiscal year ending June 30, 1949. This was all of the expenditures except $301,275,583 in fund transfers, personal funds of veteran patients and miscellaneous items. The largest amount went to veterans or to dependents of deceased veterans in the form of compensation or pension payments or retirement pay. This amounted to $1,891,283,111. Compensation or pension was paid during the fiscal year to about 3,000,000 veterans or dependents of deceased veterans for World War II, World War I, the Spanish-American War, the Indian Wars, the Civil War and the War with Mexico, and to veterans of peacetime service in the Regular Establishment with service-connected disabilities or the dependents of Regular Establishment veterans who died of service-connected causes.

The next largest amount, totaling $1,865,804,493, was paid in subsistence allowances to veterans in training or education under the GI Bill. In addition, the Veterans Administration paid to the training institutions the sum of $834,379,091 for tuition, fees and equipment to educate or train these GI Bill students.

The cost of providing medical care, hospitalization and drugs for eligible veterans during the year, plus the cost of administering the entire Veterans Administration organization of some seven hundred offices and field stations totaled $939,594,945.

Unemployment allowances under the GI Bill for the year amounted to $443,531,993 and self employment allowances under the same Act totaled $66,060,357.

Death claims for National Service Life Insurance resulted in an expenditure of $310,855,814.

Another large expenditure during the year, totaling $262,196,010, involved subsistence payments to World War II disabled veterans in education or training under Public Law 16, the Vocational Rehabilitation Act.

PERSONAL

Dr. John B. McHugh, chief, professional services at the Outwood, Ky., Veterans Hospital, will serve as manager of the veterans hospital under construction at Minot, N. D. A veteran of World War II, Dr. McHugh has served in the Veterans Administration since Nov. 1, 1939. He received his medical degree from Temple University Medical School, Philadelphia, in 1934. After graduation, he served an internship at the Easton, Pa., hospital and a residency in tuberculosis at the Glen Dale Sanatorium, Maryland. He engaged in private practice from 1937 to 1939.

V 14
1950

MISCELLANEOUS

NEW PREDOCTORAL FELLOWSHIP PROGRAM

The U. S. Atomic Energy Commission will sponsor a new predoctoral fellowship program in the biologic and physical sciences during the 1950-1951 academic year. The program will be administered on a regional basis by institutions located in the northeast, southeast, midwest and west. The new program will differ from the predoctoral program administered by the National Research Council for the Atomic Energy Commission during the 1949-1950 academic year in that the subjects of research must be sufficiently closely related to atomic energy to justify a presumption that the candidate, on completion of his studies, will be especially suited for employment by the commission or one of its contractors. The final selection of fellows will be the responsibility of the regional organizations, but it is expected that the National Research Council will be requested to assist in the selection of fellows to the extent of assessing the scientific qualifications of applicants. One hundred and thirty-nine fellowships in the physical sciences and one hundred and five in the biologic sciences will be offered under the new program. These will be in addition to the two hundred and fifty fellows expected to participate in the previously announced NRC-administered program during the next academic year. Candidates for the new fellowships must be citizens of the United States who, by the beginning of their fellowship term, will usually have completed at least one year of study beyond the bachelor's degree. However, particularly well qualified applicants will be considered for fellowships in the biologic sciences to be effective during the first year of graduate study. Each fellow will be required to have either a full security clearance as provided by the Atomic Energy Act of 1946 or "fellowship approval" as to loyalty as required by the Independent Offices Appropriations Act for fiscal year 1950. Both are granted by the Atomic Energy Commission after investigation of the candidate by the Federal Bureau of Investigation.

Although the fellows will be selected with future employability in mind, neither the Atomic Energy Commission, its contractors or the fellows are under any obligation to offer or accept such employment.

Students wishing to apply for predoctoral fellowships at institutions in the northeast area of the United States should address inquiries to: Associated Universities, Inc., Room 1611, 393 Seventh Avenue, New York 1. States in the northeast area include: Pennsylvania (except the Pittsburgh area), Maryland, Delaware, New Jersey, New York, Connecticut, Massachusetts, Rhode Island, Vermont, New Hampshire and Maine.

Students wishing to apply for predoctoral fellowships at institutions in the midwest area should address applications and inquiries to: Midwest AEC Fellowship Board, P. O. Box 5368, Chicago 80. States in the midwest area include: Pennsylvania (Pittsburgh area only), Ohio, Indiana, Illinois, Missouri, Western Oklahoma (including Oklahoma Agricultural and Mechanical College), Kansas, Nebraska, North Dakota, South Dakota, Minnesota, Iowa, Wisconsin and Michigan.

Students wishing to apply for predoctoral fellowships at institutions in the southeast should address applications and inquiries to: University Relations Division, Oak Ridge Institute of Nuclear Studies, Inc., P. O. Box 117, Oak Ridge, Tenn. States in the southeast area include: District of Columbia, West Virginia, Kentucky, Arkansas, Eastern Oklahoma (except Oklahoma Agricultural and Mechanical College), Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina, Tennessee and Virginia.

Students wishing to apply for predoctoral fellowships at institutions in the west should address applications and inquiries to: Western AEC Fellowship Board, University of California, Berkeley 4, Calif. States in the western area include: New Mexico, Colorado, Wyoming, Montana, Idaho, Utah, Arizona, Nevada, California, Washington and Oregon.

Applications must be filed by March 4, 1950. Students should submit applications to the area office under which the college or university in which they are interested is located. Students interested in filing for a fellowship at more than one institution need only file at the one area office.

Medical News

(Physicians will confer a favor by sending for this department items of news of general interest: such as relate to society activities, new hospitals, education and public health. Programs should be received at least two weeks before the date of meeting.)

ALABAMA

Seniors Plan Seminar on Diabetes.—The senior class of the Medical College of Alabama have arranged a seminar on diabetes in the auditorium of the Medical College of Alabama in Birmingham on March 9-10. Physicians and medical students are invited. There is no registration fee. The following program will be presented:

William Boyd, Toronto, Canada, (1) Pathology of Diabetes and (2) Renal Complications of Diabetes.
Seale Harris, Birmingham, Discovery of Insulin.
Geza deTakats, Chicago, Surgery in Diabetes.
Tinsley R. Harrison, Dallas, Texas, (1) Cardiac Complications of Diabetes and (2) Relation of Arteriosclerosis to Diabetes.
Cyril M. MacBryde, St. Louis, (1) Management of Diabetic Coma and (2) Newer Insulin Products.
Howard F. Root, Boston, (1) A Half Century of Progress in Diabetes and (2) Dietary Management and Use of Insulin in Diabetes.
Elmer L. Sevringhaus, New York, (1) Relation of Endocrine Glands to Carbohydrate Metabolism and (2) Pituitary, Thyroid and Adrenal in Diabetes.

There will be a public evening session on March 9 for persons with diabetes and their relatives in the Birmingham area.

COLORADO

National Jewish Hospital to Expand.—The National Jewish Hospital at Denver is beginning a five year program of expansion of its facilities for treatment, research, rehabilitation and education. The hospital is in its fifty-first year as a tuberculosis institute. Its motto is "None May Enter Who Can Pay—None Can Pay Who Enter." More than three million days of free patient care have been given to the tuberculous needy of all faiths. It was founded by B'nai B'rith in 1899 and has served nearly 50,000 patients, more than 65 per cent of whom have not been Jewish.

CONNECTICUT

Hartford Medical Society.—The Hartford Medical Society has arranged the following programs: On March 6 Dr. Maurice S. Segal, Boston, will present an afternoon clinic on "Suppurative Diseases of the Chest." His evening address will be on on "Management of the Seriously Ill Patient with Bronchial Asthma." On March 20 Dr. Robert Elman of St. Louis will hold an afternoon clinic. His evening address will be on "Protein, Electrolyte and Water Balance." On April 3 Dr. James M. Baty of Boston will present a clinic on "Office Pediatrics" and an evening address on "Hemorrhagic Nephritis in Children." On April 17 Dr. Willard O. Thompson of Chicago will give an evening address on "Endocrine Therapy in Daily Practice."

FLORIDA

Chest Physicians Meeting.—The annual meeting of the Florida chapter of the American College of Chest Physicians will be April 23 at Hollywood. Papers will be presented at the morning session; a round table conference and a panel discussion will be held in the afternoon. Invited speakers in the panel are Drs. David Kirsh and DeWitt C. Daughtry, both of Miami, and David A. Nathan of Miami Beach.

ILLINOIS

Dedicate Library.—Ceremonies marking the dedication of Marquardt Memorial Library of Memorial Hospital, Elmhurst, were held recently. The library was a gift of Dr. Edward W. Marquardt, a senior surgeon of the hospital.

Honor Andy Hall.—City, county and state medical officials attended a luncheon January 30 at Scott Air Force Base, Illinois, in honor of Dr. Andy Hall of Mount Vernon. The Honorable Milton D. Forsyth, mayor of Mount Vernon, and the Honorable H. V. Calhoun, mayor of Belleville, also were guests. Dr. Hall, who was recently awarded the gold medal of the American Medical Association for "exceptional service by a general practitioner," has three sons who are physicians. Col. Wilford Hall, chief surgeon, Military Air Transport Service, with headquarters at Andrews Air Force Base, Washington, and Dr. Andy Hall Jr. of St. Louis joined in the tribute. The third son, Dr. Marshall Hall, is associated with his father in the Mount Vernon office. After a luncheon in the officers' dining hall the guests were shown the new Air Force film, "That Men May Fly," which depicts the medical research being done in the Air Force to protect pilots in flight.

Chicago

Dr. Van Dellen Promoted.—Dr. Theodore R. Van Dellen, assistant dean of Northwestern University Medical School, has been promoted to associate professor of medicine. Dr. Van Dellen received his bachelor's and master's degrees from Northwestern and his medical degree from there in 1936. He became an assistant professor of medicine at Northwestern in 1947 and was appointed assistant dean of the Medical School in 1949. Dr. Van Dellen also is health editor of the *Chicago Tribune*.

Research on Rheumatic Fever and Heart Disease.—La Rabida Jackson Park Sanitarium and the University of Chicago have combined their resources for research on rheumatic fever and rheumatic heart disease. Funds to launch the project will be provided by the Chicago Heart Association. Dr. Albert Dorfman, assistant professor of pediatrics, University of Chicago, has been appointed research director of the joint program. Dr. Earl P. Benditt, assistant professor of pathology at the university, will be assistant director. Dr. Dorfman began his research on rheumatic fever in 1946 at the Army Medical Research and Graduate School in Washington, D. C., where he was chief of biochemistry. He received his M.D. degree and his Ph.D. degree in biochemistry from the University of Chicago School of Medicine. Dr. Benditt, a graduate of Harvard Medical School, Boston, has been associated with the University of Chicago since 1944.

Appoint New Dean at Illinois.—Dr. Stanley W. Olson, assistant director of the Mayo Foundation, Rochester, Minn., has been appointed dean of the University of Illinois College of Medicine effective April 1, succeeding Dr. John B. Youmans, who has accepted the deanship of medicine at Vanderbilt University, Nashville, Tenn. Dr. Olson will assume his new position with rank of professor at the university's Chicago professional colleges and will serve as medical director of the university's research and educational hospitals. He has been a member of the staff of the Mayo Foundation since he was released from duty in the Army in 1946. Dr. Olson, who is 36 years of age, will be the youngest physician to hold the deanship of medicine at the University of Illinois. He graduated from Wheaton College in 1934 and received his M.D. degree four years later from the University of Illinois, ranking first in his class. He took intern training at Cook County Hospital and a residency at the Municipal Contagious Disease Hospital, both of Chicago. He received the Master of Science degree at the University of Minnesota in 1943.

Lowest Diphtheria Case Rate.—According to Dr. Herman N. Bundesen, president of the Board of Health, Chicago in 1949 had the lowest diphtheria case rate in the nation among cities of more than 500,000 population. No diphtheria death occurred and only five cases were recorded, a case rate of 0.1 per 100,000 population. Other cities of over 500,000 population that recorded no deaths from diphtheria in 1949 are Milwaukee, Cleveland and Pittsburgh. Ten years ago 588 cases and 56 deaths were reported here, and twenty years ago there were 6,012 cases and 513 deaths. Chicago's low diphtheria death rate is credited to the intensive inoculation program carried out by the health department and private physicians, with the continuous support of the press. In addition to isolation of patients and inoculation of contacts, health department nurses make house to house surveys in the entire neighborhood surrounding the home where the patient resided to determine the children under the age of 15 who either have not been primarily inoculated against the disease or have been inoculated more than two years prior to the occurrence of the case.

IOWA

Society Program.—The Linn County Medical Society, meeting March 9 at the Hotel Roosevelt in Cedar Rapids, will hear Dr. Alston Callahan, professor of ophthalmology at the Medical College of Alabama, Birmingham, speak on "Retina; Observations of Interest to the General Practitioner."

MASSACHUSETTS

$500,000 for Research on the Common Cold.—Harvard Medical School, Boston, will receive about $500,000 for use in seeking a cure for the common cold through a bequest by the late Paul V. Bacon of Wellesley, a textbook publisher. The fund is placed at the disposal of the medical school until such time as a definite cure for the common cold is found, at which time the rest and residue of the fund shall be paid over to Harvard.

MICHIGAN

Psychosomatic Research on Peptic Ulcer.—Harper Hospital, Detroit, announces a grant of $10,000 from the U. S. Public Health Service to Dr. Louis A. Schwartz for research on the psychosomatic aspects of peptic ulcer. An attempt will be made to determine the psychodynamic factors that may precipitate peptic ulcer in types of personality structure. Individual psychotherapy will be extended to some patients, while other will be treated by group psychotherapy. It is planned to repeat these observations following vagotomy in some cases.

New Maternity Hospital.—The University of Michigan's new $1,725,000 Maternity Hospital was opened for patients February 14. The new four story brick building east of University Hospital has accommodations for 75 mothers. Instead of one large nursery there are fifteen small nurseries adjacent to the rooms to allow mothers a closer association with their infants. The building has been under construction since May 1948. Space has been provided for classes in obstetrics, gynecology and pediatrics.

MINNESOTA

Personal.—Dr. Wilford E. Park has been named director of the Division of Industrial Health of the Minnesota Department of Health. Dr. Park comes from Chalk River, Ontario, Canada.

Dr. Balfour Receives Medal.—Dr. Donald C. Balfour of Rochester, director emeritus of the Mayo Foundation for Medical Education and Research, received the University of Minnesota's "Builder of the Name" medal February 16, at a Charter Day convocation highlighting the annual University of Minnesota Week. Dr. Balfour is the fourth person to receive the award for outstanding service to the university. He received his M.D. degree in 1906 from the University of Toronto, Canada. He joined the staff of the Mayo Clinic in 1907, was named head of a section in the division of surgery in 1912 and later became chief of the division. He was appointed professor of surgery in the University of Minnesota's Mayo Foundation at Rochester in 1923, was named associate director in 1935 and became director of the foundation in 1937.

NEW JERSEY

Amputee Conference.—The Kessler Institute for Rehabilitation, Pleasant Valley Way, West Orange, will hold its annual Amputee Conference April 20-22. Subjects under discussion include prosthesis of upper and lower extremities, basic surgery, selection and fit, training principles and gait studies. The registration fee is $5.

Society Election.—The New Jersey Association of Industrial Physicans and Surgeons held its annual meeting at Newark on January 13 and elected to office for the ensuing year Drs. Charles S. McKinley, Bound Brook, president; George A. Paul, Harrison, secretary, and Ralph A. Young, Linden, treasurer.

Doctors' Chorus Concert.—The Doctors' Chorus of the Essex County Medical Society will give a concert April 12 at 8:30 p. m. in the auditorium of the Mutual Benefit Life Insurance Company in Newark. The chorus gives financial support to recognized public charities in which the Essex County Medical Society participates. The net proceeds this year will be given to the Essex County Service for the Chronically Ill.

Personals.—Dr. M. William Amster has been appointed head of the medical service department of Schering Corporation, Bloomfield, N. J., succeeding Dr. Norman L. Heminway, who is now associate director of Schering's Clinical Research Division.——Dr. Hyman I. Goldstein, Camden, has been elected honorary member of the French Society of Gastroenterology. ——Dr. Laurence M. Collins, Greystone Park, has been appointed a Knight of St. Gregory by Pope Pius XIII. Dr. Collins is a former president of the Morris County Medical Society.

NEW YORK

Dr. Phemister to Give Roswell Park Lecture.—The Buffalo Surgical Society announces the award of the Roswell Park Medal to Dr. Dallas B. Phemister, Chicago, for outstanding achievement. Dr. Phemister will give the Roswell Park Lecture at an invitation dinner March 30 at the Hotel Statler in Buffalo on "Changes in the Treatment of Infections of Bones and Joints Since the Introduction of Antimicrobial Drugs."

Postgraduate Lectures.—The Medical Society of the State of New York in cooperation with the New York State Department of Health has arranged the following postgraduate lectures: The Rensselaer County Medical Society, meeting March 14 at 8:30 p. m. at the County Court House in Troy, will hear Dr. Arthur C. DeGraff, New York, speak on "Coronary Artery Insufficiency; Its Recognition and Treatment." On April 11 at the same time and place Dr. J. William Hinton, New York, will address the society on "The Intractable Ulcer, with Emphasis on the Indications for Surgery." The Clinton County Medical Society, meeting March 16 at 8:15 p. m. at the Champlain Valley Hospital Nurses Home in Plattsburg, will hear Dr. David K. Miller, Buffalo, speak on "Recognition and Management of the Common Virus Diseases." Dr. George G. Deaver, New York, will address the Oneida County Medical Society March 30 at 8:30 p. m. in Hutchings Hall, Utica State Hospital, Utica, on "Medical Rehabilitation."

New York City

Sixth Harvey Lecture.—Dr. William S. Tillett, professor of medicine, New York University College of Medicine, will deliver the sixth Harvey Lecture of the current series at the New York Academy of Medicine March 16 on "Studies on the Enzymatic Lysis of Fibrin and Inflammatory Exudates by Products of Hemolytic Streptococci."

Radiation Therapy Alumni Meeting.—At the annual meeting of the Bellevue Hospital Radiation Therapy Alumni Association March 23 at 1 p. m. in the Administration Building, the Ira I. Kaplan Lecture will be delivered by Dr. John F. Daly, associate professor of otolaryngology at New York University-Bellevue Medical Center, on "Management of the Cancer Problem in Head and Neck."

Creedmoor Institute.—Creedmoor State Hospital, Queens Village, dedicated its Institute for Psychobiologic Studies February 9. It will treat outpatients with psychiatric disorders and psychosomatic disease by biochemical means. Director of the new institute is Dr. Johan H. W. van Ophuijsen, who has been associated with the New York Psychoanalytic Institute. Dr. Co Tui, former associate professor of experimental surgery at New York University College of Medicine, is director of biologic research.

Elsberg Lecture in Neurosurgery.—Dr. Ernest Sachs, research associate in physiology at Yale University School of Medicine, New Haven, Conn., and emeritus professor of neurosurgery, Washington University School of Medicine, St. Louis, has been invited to deliver the first annual Charles A. Elsberg Lecture before the New York Society of Neurosurgery at 8:30 p. m. March 21 at the New York Academy of Medicine. Dr. Sachs will speak on "Observations Based on a Review of Nine Hundred Laminectomies."

Exhibit of Medical Books.—Books written by physicians of New York City during 1949 were on exhibition through February in the library of the New York Academy of Medicine. Of the sixty-nine volumes exhibited, fifty-five are first publications and fourteen are new editions of earlier printings. A number of the volumes deal with medical subjects written for lay readers. Miss Janet Doe, librarian, said that it is the intention of the academy to hold these exhibitions annually and that an invitation is issued to physicians of New York City to send copies of their works published during 1950 to the academy, earmarking them for next year's exhibit.

Plan for Admitting Disabled to University.—New York University has a plan under which handicapped persons whose physical ability to carry on studies at the university is in question are to be referred to the Institute of Physical Medicine and Rehabilitation for evaluation. If applicants are rated as physically capable in the judgment of the institute's physicians, the university will admit them, providing they have qualified scholastically and in other ways. The university's new plan was organized by Elwood C. Kastner, registrar and supervisor of admissions, and Dr. Howard A. Rusk, chairman, department of physical medicine and rehabilitation, New York University-Bellevue Medical Center.

New Diagnostic Clinic.—The Hospital Department's second new diagnostic clinic for ambulatory patients was officially opened at the Morrisania City Hospital in the Bronx on February 9 as part of its program of expanding services for the medically indigent. Patients will be accepted by the new clinic for study and diagnosis on an appointment system. Sessions will be held each week on Tuesday and Thursday from 10 a. m. to noon and Thursday from 2 to 4 p. m. Each patient will be given a thorough medical check-up including roentgenograms, laboratory tests and consultative services. From the diagnostic clinic patients will be referred to specialty clinics at the hospital. A group clinic for ambulatory patients at Bellevue Hospital, with an appointment system and complete medical and surgical teams, was opened on January 10 (THE JOURNAL, January 28, p. 268).

Tenth Hospital Joins Regional Plan.—Vassar Brothers Hospital in Poughkeepsie and the New York University-Bellevue Medical Center affiliation under the center's Regional Hospital Plan is the tenth established with hospitals within a 100 mile radius of New York City. The Regional Hospital Plan, which is a part of the teaching program of the center Post-Graduate Medical School, is designed to bring physicians in outlying nonteaching hospitals the advantages of a working relationship with a university medical center. With the support of the W. K. Kellogg Foundation, the plan is now serving hospitals in Connecticut, New Jersey, New York and Pennsylvania. The Vassar Brothers Hospital is a voluntary general hospital having 250 beds and bassinets and fifteen clinics for outpatients. It serves an estimated 120,000 persons in Poughkeepsie and the surrounding rural area. The participating hospitals undertake to carry out a comprehensive educational program for their medical staffs. As is done by other hospitals in the plan, Vassar Brothers Hospital will appoint a coordinator who will take responsibility for the functioning of its training program.

NORTH CAROLINA

Appoint Director of New Medical Affairs Division.—Dr. Henry T. Clark Jr., medical director of Vanderbilt University Hospital, Nashville, Tenn., has been appointed administrator of the Division of Medical Affairs of the University of North Carolina School of Medicine, Chapel Hill, effective May 1. Dr. Clark will head the new division of the university that includes five health professional schools and the hospital: the expanded four year school of medicine, schools of pharmacy, public health and dentistry and the new four year school of nursing. Dr. Clark received his medical degree at the University of Rochester in 1944.

OHIO

Course in General Surgery.—"Practical Problems in General Surgery" is the subject of a continuation course to be presented April 6-8 by the Frank E. Bunts Institute and the Cleveland Clinic. On April 7 Dr. Daniel C. Elkin of Emory University School of Medicine, Atlanta, Ga., Dr. Claude S. Beck of Western Reserve University School of Medicine, Cleveland, and Dr. Rupert B. Turnbull Jr. of the Cleveland Clinic will take part in a symposium on vascular surgery. On April 8 Dr. George G. Finney of Johns Hopkins University School of Medicine, Baltimore, and others will present panel discussions on surgery of the colon, pancreas, biliary tract and stomach and duodenum. Inquiries should be addressed to the Director of Education, Frank E. Bunts Educational Institute, 2020 East Ninety-Third Street, Cleveland 6.

OREGON

Tillamook County Hospital Dedicated.—Tillamook County dedicated its new $1,170,000 seventy-five bed hospital January 21. This concrete and brick structure is the first of Oregon's new hospitals to receive participating federal funds under the Hill-Burton Act. The three story building contains complete laboratory and radiology facilities. Each patient room is equipped with a two way intercommunication system and oxygen outlets. Expansion of the hospital to a hundred bed unit is planned after the contemplated nurses home has been completed.

VIRGINIA

First Alpha Epsilon Iota Lecture.—Dr. Helen B. Taussig of Johns Hopkins University, Baltimore, delivered the first lecture in an annual series to be sponsored by the Alpha Epsilon Iota Sorority of the Medical College of Virginia, Richmond, February 17 on "Cyanotic Malformations Amenable to Surgery —Diagnosis and Differential Diagnosis."

WEST VIRGINIA

Two Day Public Health Conference.—The West Virginia University School of Medicine is sponsoring a two day public health conference at Morgantown March 31 and April 1 on "Problems in Public Health as Applied to West Virginia." The purpose is to stimulate interest in the public health program of the state. Papers will be presented in the morning and afternoon on Friday and in the morning on Saturday. The speakers are: Dr. Robert J. Anderson, Washington, D. C., chief, Tuberculosis Division, U. S. Public Health Service; Mr. J. J. Bloomfield, assistant chief, Industrial Hygiene Division, U. S. Public Health Service; Dr. Newman H. Dyer, director, state department of health; Dr. William McD. Hammon, head of the department of epidemiology, University of Pittsburgh School of Public Health, and Dr. Paul D. White, professor of medicine, Harvard University School of Medicine, Boston. Dr. Leonard A. Scheele, Washington, D. C., surgeon general of the U. S. Public Health Service, will be the speaker at the banquet Friday evening, and Dr. Thomas Parran, former surgeon general and now dean of the School of Public Health of the University of Pittsburgh, will be the speaker at the luncheon on Saturday.

Sanitation Survey in McDowell County.—An intensive investigation of sanitation hazards in McDowell County is being made by the state department of health. The program, covering each community in the area, will include inspection of public water supplies, treatment and distribution of water, inspection of methods of waste disposal and survey of methods of refuse collection and disposal. Recommendations will be made to officials for the elimination or correction of existing hazards to public health. The McDowell study will continue for six months; it is planned to conduct similar studies in other communities.

WISCONSIN

Marquette Spring Clinics.—The Marquette Medical School Spring Clinics will be held at Veterans and County hospitals and at the medical school auditorium March 17-18. Visiting speaker at the evening meeting, held in conjunction with the Medical Society of Milwaukee County at the Milwaukee Athletic Club, will be Dr. Edward L. Compere, Chicago, on "Recognition and Treatment of the More Common Injuries of the Wrist." The Alumni Award will be presented to Dr. Thomas J. Canty, Mare Island, Calif., on Saturday afternoon for his work on rehabilitation of naval amputees. He will speak on "Amputation Rehabilitation." The meeting will close with a banquet at the Schroeder Hotel.

GENERAL

Information Concerning Israel.—Dr. I. Zusmanovitz, secretary-general of the Israel Medical Association, will be in the United States for several weeks, during which time he will be glad to give any information or advice to physicians who intend to go to Israel permanently or for a short visit. Communications may be addressed to him at the American Committee of OSE, 24 West Fortieth Street, Room 303, New York 18.

Award in Orthopedic Surgery Research.—At the recent annual dinner of the American Academy of Orthopaedic Surgeons Dr. Marshall R. Urist, Los Angeles, was announced the winner of the Kappa Delta Award, which includes a prize of $1,000, for his research, "The Mechanism of Endosteal Bone Formation." The award is given each year by the Kappa Delta Sorority for the most outstanding piece of research in orthopedic surgery.

Milk Producers Oppose Federal Health Control.—The National Milk Producers Federation at its recent convention passed a resolution, which read in part as follows:

"The Federation strongly opposes socialized medicine but recommends encouraging prepaid medical, hospital and dental care on a voluntary basis divorced from federal governmental control or supervision. Federal health programs and aids should be related to definite needs with state and local autonomy preserved. Compulsory extension of health services without local and individual responsibility will destroy the basic objectives sought in a national health program."

Nursing in Poliomyelitis.—Limitation of funds makes it necessary to charge 35 cents per copy for the eighty-eight page handbook, "Nursing for the Poliomyelitis Patient," published in 1948. Sale of this publication is limited to nurses, physicians, physical therapists and members of allied professional groups. Orders should be sent to the Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York 19. Heretofore this handbook was distributed without charge.

Society Elections.—The American Academy of Orthopaedic Surgeons at their meeting February 16 installed as president Dr. Guy A. Caldwell of New Orleans and chose Dr. Joseph S. Barr, Boston, president-elect; Dr. Harold B. Boyd, Memphis, Tenn., secretary, and Dr. H. Relton McCarroll, St. Louis, treasurer.——The Sioux Valley Medical Association at a meeting in Sioux City, Iowa, elected Dr. Walter Benthack of Wayne, Neb., as president, Dr. Edward H. Sibley of Sioux City as secretary and Dr. Anton Hyden of Sioux Falls, S. D., as treasurer.

Fellowships for Chinese Students.—The American Bureau for Medical Aid to China is offering fellowships for 1950-1951 to Chinese citizens now in the United States who hold or are in training for professional degrees. The fields covered are

medicine (including the basic medical sciences), public health, nursing, dentistry, medical technology, nutrition and hospital management. Monthly stipends and tuition fees are covered by the grants. Applications must be in by April 30. Information may be obtained by writing to the organization at 1790 Broadway, New York 19.

International Physiological Congress.—This congress will be held in Copenhagen, Denmark, August 15-18. Those eligible for membership in the congress are professors and lecturers in physiology and the allied sciences, members of physiologic and similar scientific societies and persons who are recommended by their national committee. Registration forms should be sent to the secretary-general, Prof. B. Brandt Rehberg, Zoofysiologisk, Laboratorium, Juliane Maries Veg 32, Copenhagen, Denmark. Abstracts of papers, limited to fifteen minutes, should be sent to Copenhagen by April 15.

American Goiter Association.—This association will hold its annual meeting at the Shamrock Hotel in Houston, Texas, March 9-11 under the presidency of Dr. Samuel F. Haines, Rochester, Minn. General subjects of the sessions are: Diagnostic Methods in the Study of Human Thyroid Disease; Radio Iodine Treatment of Hyperthyroidism; The Adrenals and Thyroid Disease; Exophthalmos; Cancer of the Thyroid, and Nontoxic (Sporadic or Endemic) Goiters. The presidential address will be given Friday afternoon on "The Influence of Research on the Modern Treatment of Exophthalmic Goiter." The annual banquet will be held Friday at 8 p. m.

Study of Goiter in Ceylon.—An investigation of endemic goiter in Ceylon is to be carried out by Dr. Dagmar F. Wilson of Oxford, England, under World Health Organization auspices at the request of the government of Ceylon. Dr. Wilson was born in Karachi, India, and was a member of the Women's Medical Service of India from 1916 to 1925. She represented the Indian Government at international conferences on child welfare. Since 1943 she has been attached to the University Laboratory on Human Nutrition at Churchill Hospital, Oxford, England. A recent report of a joint expert committee on nutrition of the World Health Organization and the Food and Agriculture Organization pointed out that the incidence of endemic goiter was alarmingly high in some regions.

Scholarships in Medical Social Work.—The Wheat Ridge Foundation of Wheat Ridge, Colo., offers eight scholarships in medical social work for the academic year 1950-1951 to qualified students who are members of the Lutheran Church. Each scholarship is worth $1,000 plus tuition fees. The scholarships may be used in schools offering the full medical social work program approved by the American Association of Medical Social Workers. A candidate must be a graduate of an accredited college or must present evidence that he will be a graduate of such a college by June 30, 1950. Persons who have completed part of their graduate training in social work are also invited to become candidates. Scholarships may be renewed for a second year. Applications must be completed by April 1. Address inquiries to Wheat Ridge Foundation Committee on Scholarships, Valparaiso University, Valparaiso, Ind.

Incidence of Influenza.—According to the U. S. Public Health Service, a total of 16,223 cases of influenza in the United States were reported for the week ended February 18. This is more than twice the number of cases reported for the previous week (7,967) and more than three times the number reported for the corresponding week last year (4,792). The five year (1945-1949) median for the week is 4,792. The high corresponding week during the past five years was in 1948, when 11,234 cases were reported. The cumulative total for the calendar year is 49,640 cases of influenza as compared with 32,208 for the same period last year, with 37,425 for the corresponding median. The high year during the past five years was 1946, when 147,779 cases were reported during the first seven weeks of the year.

States showing the largest increases for the current week over the previous week were: Arkansas (212 to 361); Colorado (45 to 179); Idaho (26 to 102); Montana (25 to 335); Nebraska (9 to 48); North Dakota (2 to 156); Texas (4,796 to 10,980); Virginia (1,274 to 2,259); West Virginia (78 to 383), and Wyoming (0 to 20).

Progress on Modernizing Sanitary Regulations.—A subcommittee of the World Health Organization's Expert Committee on International Epidemiology and Quarantine met in Geneva, Switzerland, in February to draft international sanitary regulations which will replace several sanitary conventions now in use. The new regulations, which will be applicable to all means of international transport, aim to insure maximum security against transmission of epidemics and minimum interference with world traffic. The draft regulations will be transmitted to governments for comments and then will be submitted to the full Expert Committee on Epidemiology and Quarantine before the end of the year. It is expected that the final text will be ready for the fourth World Health Assembly in the spring of 1951. Members of the subcommittee are: Chairman J. Hostie, Foreign Office, Brussels, Belgium; H. B. Calderwood, U. S. State Department, Washington, D. C.; Miss J. A. C. Gutteridge, assistant legal adviser, Foreign Office, London, England, and J. Secretan, professor of law, Lausanne, Switzerland.

LATIN AMERICA

Society Election.—The Sociedad Yucateca de Obstetricia y Ginecologia has elected the following officers for the year 1949-1950: Drs. Andrés Peniche Canton, president; Humberto Sauri Cisneros, vice president; Clodomiro Gonzalez Ortiz, general secretary; Enrique Perez Roca, recorder, and Marcelino Peniche Alcocer, treasurer.

Argentinian Association for Rheumatic Studies.—This society was established on December 15 in the general assembly gathered at the Argentinian Medical Association headquarters. It originated during the Medical Days on Rheumatism in Santiago del Estero y Tucuman and has been constituted as a federation, having a central directive committee and councils in the provinces and territories. Officers of the directive committee are Dr. Guido Costa Bertani, president, and Dr. Rodolfo Rey Sumay, secretary. The society's address is Hipolito Yrigoyen 4177, Buenos Aires, Republic of Argentina.

FOREIGN

The Treacher Collins Prize Essay.—The Council of the Ophthalmological Society of the United Kingdom is offering for the Treacher Collins Prize Essay the sum of £100, awarded triennially, for the best essay in English submitted on a selected subject, which for the next award is "Exophthalmos in Relation to Endocrine Disorder." The competition is open to qualified medical practitioners of any nationality. The closing date for sending in essays is Sept. 30, 1951. They should be submitted to the Honorary Secretary, Ophthalmological Society of the United Kingdom, 45 Lincoln's Inn Fields, London, W.C.2, from whom also any further particulars can be obtained. No name should be on any essay, but a distinguished pseudonym or quotation, which should be on a sealed envelope containing the candidate's name and address, should accompany the essay.

Course in Neurosurgery.—A postgraduate course in neurosurgery will be held at the Medical School of the National Hospital, Queen Square, Institute of Neurology, London, from May 22 to July 1. The course includes lectures on neurosurgical and ancillary subjects, clinical demonstrations, attendance at outpatient clinics and surgical ward rounds. Attendance at operations may also be arranged at the discretion of the surgeons. Among the guest lecturers will be: Prof. Norman M. Dott, Edinburgh; Prof. Sir James R. Learmouth, Edinburgh; Dr. Ludo van Bogaert; Prof. J. Llermitte; Prof. Herbert J. Seddon, Middlesex; Prof. C. Olof Sjoqvist, Stockholm; Prof. Th. Alajouanine; Dr. Almeida Lima, and Dr. Arne Torkildsen. The fee for the course is £26.5.0. Applications for places and for further particulars should be made to the Dean, National Hospital, Queen Square, Institute of Neurology, London, W.C.1, England.

Marriages

DONALD NOSWORTHY TWADDELL, Scarsdale, N. Y., to Miss Elizabeth Bancroft Smith of Swarthmore, Pa., December 28.

JOHN GARO KOOMEY, Lewiston, Maine, to Miss Margaret Louise Elliott of Centerville, Mass., November 26.

VINCENT EDWARD LOWERY, San Francisco, to Miss Virginia Teresa Metz of Richmond, Va., December 10.

GUS J. VLASIS, Chattanooga, Tenn., to Miss Maria Roupas of Richmond, Va., December 11.

ALBERT A. CARP, Philadelphia, to Miss Helen Topol of New York, January 19.

ROBERT S. HEIDT to Miss Anne Nurre, both of Cincinnati, November 19.

IRA I. MILLER to Miss Sandra Harris, both of New York, December 11.

SIEGFRIED SCHERL to Miss Lila Lesnick, both of New York, January 1.

Deaths

John Marion Lore ● New York; born in Corleone, Italy, in 1892; University and Bellevue Hospital Medical College, New York, 1915; served as clinical professor of otorhinolaryngology at his alma mater, now known as the New York University College of Medicine, of which he was alumni director and in 1947-1948 president of the college alumni association; clinical professor of otorhinolaryngology at the New York Post-Graduate Medical School and Hospital, Columbia University; specialist certified by the American Board of Otolaryngology; member of the New York Academy of Medicine, American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; a medical officer in the Navy during World War I; served in the Selective Service System during World War II; past president of the Italian Medical Association in New York and in 1938 was made a Knight of the Kingdom of Italy; affiliated with the New York Foundling, Manhattan Eye and Ear, Columbus and the French hospitals; director of the division of otolaryngology at St. Vincent's Hospital, where he died January 21, aged 57, of coronary thrombosis.

Hugh Henry Trout ● Roanoke, Va.; born in Staunton, Va., June 8, 1878; University of Virginia Department of Medicine, Charlottesville, 1902; member of the House of Delegates of the American Medical Association in 1934, 1935 and 1941 and chairman of the Section on Surgery, General and Abdominal, 1937-1938; member of the founders group of the American Board of Surgery; past president of the Medical Society of Virginia, Roanoke Academy of Medicine and the Southern Surgical Association; member of the American Surgical Association, International Surgical Association, American Association for the Surgery of Trauma and the American Association for Thoracic Surgery; fellow of the American College of Surgeons; served overseas during World War I; founder and president of Jefferson Hospital; member of the board of visitors of the University of Virginia, Charlottesville, and Mary Washington College, Fredericksburg; died January 13, aged 71, of coronary thrombosis.

Andro E. Lee ● Surgeon, Lieutenant Commander, U. S. Navy, retired, Lake Forest Park, Wash.; born in 1880; Johns Hopkins University School of Medicine, Baltimore, 1906; entered the U. S. Navy as assistant surgeon with the rank of lieutenant (jg) in June 1906; during his thirty-six years of naval service he was assigned to the U. S. Fisheries Steamer *Albatross*, the American Legation Guard at Peiping, China, the Civilian Conservation Corps and also many of the Navy's shore stations and ships of the fleet; during World War I served aboard the U. S. S. *Great Northern*; in 1937 was placed on the retired list; in 1939 volunteered for recall to active duty; served in World War II and in 1945 was released from active duty; died in the U. S. Naval Hospital, Bremerton, January 23, aged 69.

Scott Clark Runnels, Claremont, Calif.; born in Indianapolis June 5, 1882; Indiana Medical College, School of Medicine of Purdue University, Indianapolis, 1907; University of Michigan Homeopathic Medical School, Ann Arbor, 1908; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; at one time practiced in Cleveland and was affiliated with the Huron Road Hospital in East Cleveland; served during World Wars I and II; connected with the health department in Los Angeles; died January 2, aged 67.

James William Hartigan, Morgantown, W. Va.; University of Wooster Medical Department, Cleveland, 1884; Bellevue Hospital Medical College, New York, 1887; formerly a member of the state legislature and on the faculty of West Virginia University; served during World War I; established and operated Hartigan Hospital; superintendent of the Weston (W. Va.) State Hospital and chief surgeon at McKendree Emergency Hospital in McKendree; author of a textbook on anatomy and physiology; died January 28, aged 86, of cerebral hemorrhage.

George Lorenzo Adams, Washington, D. C.; Howard University College of Medicine, Washington, 1929; died January 17, aged 47, of coronary occlusion.

Mary Brooks Baird ● Claremont, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Illinois State Medical Society; died January 21, aged 75.

Sherman W. Bates, Akron, N. Y.; University of Buffalo School of Medicine, 1895; member of the American Medical Association; died January 19, aged 81, of uremia.

David William Bell, Lincoln, Neb.; John A. Creighton Medical College, Omaha, 1919; served as a member of the rating board in the Veterans Administration; veteran of World War I; died December 31, aged 70.

Adolph Bocsse ● Coffeyville, Kan.; University of Kansas School of Medicine, Kansas City, 1924; died December 26, aged 58.

Whitefield Bowers, Michigan City, Ind.; Marion-Sims College of Medicine, St. Louis, 1899; veteran of the Spanish-American War and World War I; at one time health officer and member of the board of health; affiliated with the Indiana State Soldiers Home Hospital, Lafayette, where he died January 12, aged 78, of chronic myocarditis and arteriosclerosis.

Joseph Conn Browning, Germantown, Ky.; Medical College of Ohio, Cincinnati, 1883; honorary director of the Bank of Germantown; died December 27, aged 94.

John Henry Bullock, Washington, D. C.; Medical College of Virginia, Richmond, 1915; member of the American Medical Association; died January 13, aged 58, of coronary occlusion.

Francis Fairly Burton, Okolona, Miss.; Meharry Medical College, Nashville, Tenn., 1934; served during World War II; burned to death December 30, aged 43.

Rufus Emery Butler, Waitsburg, Wash.; Rush Medical College, Chicago, 1887; formerly member of the state legislature; served on the city council and school board; a director of the First National Bank; died in Dayton January 10, aged 93.

William Caldwell Calhoun ● New York; Columbia University College of Physicians and Surgeons, New York, 1898; died in St. Luke's Hospital December 31, aged 74.

John Houston Carraway ● Sherman, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; affiliated with St. Vincent's Hospital, where he died December 15, aged 70, of cerebral hemorrhage.

George B. Carter, Bluffton, Ga.; Atlanta Medical College, 1892; member of the American Medical Association; died recently, aged 88, of cerebral hemorrhage.

Michael Chirurg, Newton, Mass.; Medical College of Indiana, Indianapolis, 1888; died January 16, aged 82.

Clara Kate Clendon, Cleveland; Cleveland Homeopathic Medical College, 1898; affiliated with Woman's Hospital, where she died January 8, aged 82, of toxic myocarditis and pneumonia.

William Vestal Coffin, Whittier, Calif.; Miami Medical College, Cincinnati, 1880; founder and trustee of Whittier College; died December 25, aged 92, of pellagra.

Maxwell Xavier Colby ● Long Branch, N. J.; University of Glasgow Medical Faculty, Scotland, 1934; served during World War II; chief cardiologist at Monmouth Memorial Hospital; died December 18, aged 42, of acute lymphatic leukemia.

Walter Harvey Coleman, Evansville, Ind.; University of Louisville Medical Department, 1900; member of the American Medical Association; affiliated with the Protestant Deaconess Hospital; died in Jennie Stuart Memorial Hospital, Hopkinsville, Ky., January 7, aged 72, of subarachnoid hemorrhage as the result of an automobile accident.

Robert Stanley Coppess, Springfield, Ohio; Ohio State University College of Homeopathic Medicine, Columbus, 1919; member of the American Medical Association; industrial medical officer in charge of civilian dispensary, Area B, Wright-Patterson Air Force Base, Dayton; died January 6, aged 59, of mixed tumor of the left parotid.

Edwin Charles Cort, Fort Belvoir, Va.; Johns Hopkins University School of Medicine, Baltimore, 1907; fellow of the American College of Physicians and the American College of Surgeons; medical missionary who served many years in Siam and received many honors; died in the Alexandria (Va.) Hospital January 10, aged 70, of coronary thrombosis.

Clay Faulkner Crowder, Maryville, Tenn.; University of Tennessee Medical Department, Nashville, 1899; member of the American Medical Association; past president of the Blount County Medical Society; affiliated with Blount Memorial Hospital, where he died January 12, aged 75, of acute leukemia.

Eugene Lee Crowson, Pickering, Mo.; Northwestern Medical College, St. Joseph, 1890; member of the American Medical Association; served two terms as county coroner; died in St. Francis Hospital January 1, aged 84, of cerebral hemorrhage.

● Indicates Fellow of the American Medical Association.

Herman Knowlton De Groat, Buffalo; University of Buffalo School of Medicine, 1897; member of the American Medical Association; formerly on the faculty of his alma mater; for many years affiliated with Buffalo City Hospital, now known as the Edward J. Meyer Memorial Hospital; died January 4, aged 78, of arteriosclerotic heart disease.

William Frederick Deutsch, New York; College of Physicians and Surgeons, Baltimore, 1906; died in Flushing, N. Y., January 10, aged 68, of hypertension.

Samuel O. Eads, Somerset, Ky.; Hospital College of Medicine, Louisville, 1890; member of the American Medical Association and the Illinois State Medical Society; died in the Good Samaritan Hospital, Lexington, January 3, aged 80, of cerebral arteriosclerosis and bronchopneumonia.

George R. Enloe ● Fort Worth, Texas; University of Texas School of Medicine, Galveston, 1923; fellow of the American College of Surgeons; served as vice president of the Texas Surgical Society and as president of the Texas Railway Surgeons' Association; affiliated with the Harris Memorial Methodist Hospital and the Harris Clinic; died November 8, aged 50, of heart disease.

Earl Wellington Euans, Columbus, Ohio; Ohio Medical University, Columbus, 1897; member of the American Medical Association; died in Grant Hospital November 26, aged 78.

Shields Wesley Fair, Kansas City, Mo.; University Medical College of Kansas City, 1900; member of the American Medical Association; formerly practiced in Belton, where he was city physician and past president of the Cass County Medical Society; served during World War I; for many years on the staff of Trinity Lutheran Hospital, where he died January 19, aged 76, of perforating duodenal ulcers and arteriosclerosis.

Lee V. Frazier, Brazil, Tenn. (licensed in Tennessee in 1903); died November 18, aged 84, of carcinoma.

Edward Lee Fredericks, Manchester, Mo.; National University of Arts and Sciences Medical Department, St. Louis, 1918; member of the American Medical Association; formerly on the staff of the Evangelical Deaconess Hospital in St. Louis; died December 2, aged 65, of paralysis agitans.

Henry Blanke Gettys, St. Louis; St. Louis University School of Medicine, 1902; member of the American Medical Association; served during World War I; formerly medical director and chief surgeon for the city police department and member of the board of education; died in St. John's Hospital January 11, aged 68, of arteriosclerotic heart disease and pneumonia.

Harrison Dilwyn Goehring ● Montclair, N. J.; University of Pittsburgh School of Medicine, 1930; specialist certified by the American Board of Radiology; member of the New England Roentgen Ray Society, Radiological Society of North America and the American College of Radiology; served during World War II; on the staff of the Montclair Community Hospital, where he died January 17, aged 44, of ruptured gastric ulcer.

John Hurter Gordon Jr., Birmingham, Mich.; University of Michigan Medical School, Ann Arbor, 1948; certified by the National Board of Medical Examiners; interned at Harper Hospital in Detroit; intern at the Syracuse University Medical Center in Syracuse, N. Y.; killed January 21, aged 25, in an automobile accident.

John Richard Gott Sr., Murfreesboro, Tenn.; University of Nashville Medical Department, 1898; member of the American Medical Association; on the staff of Rutherford Hospital; died December 23, aged 74, of coronary thrombosis.

Charles William Harreys ● Ridgewood, N. J.; Long Island College Hospital, Brooklyn, 1898; fellow of the American College of Surgeons; served on the staffs of Paterson General Hospital in Paterson, Hackensack Hospital in Hackensack, Doctors Hospital in New York and the Nathan and Miriam Barnert Memorial Hospital in Paterson, where he died December 31, aged 72, of cerebral thrombosis.

Jenkins Hightower, Chicago; Chicago Medical School, 1932; served during World War I; died in Michael Reese Hospital January 24, aged 57, of carcinoma of the head of the pancreas.

George A. Himmelsbach ● Buffalo; University of Buffalo School of Medicine, 1891; served on the faculty of the University of Buffalo Dental School; affiliated with the Buffalo General Hospital; died January 16, aged 82, of coronary thrombosis.

John Rodger Hodges, Henderson, Ky.; Hospital College of Medicine, Louisville, 1904; member of the American Medical Association; served during World War I; died January 4, aged 69, of cirrhosis of the liver.

Everett May Hurst ● Cloverdale, Ind.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; director of the Cloverdale First National Bank; died January 4, aged 75, of heart disease.

Jay William Jordan, Iron City, Tenn.; Atlanta School of Medicine, 1908; member of the American Medical Association; died November 22, aged 67, of carcinoma of the throat.

Edward Pelham McGehee, Lake Village, Ark.; Medical College of Alabama, Mobile, 1894; member of the American Medical Association; past president of the Chicot County Medical Society; medical director of the Lake Village Infirmary, which he founded; died January 9, aged 80, of carcinoma of the bladder.

Charles Percy Major, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1907; served during World War I; on the staff of Germantown Hospital; died in Graduate Hospital January 19, aged 66, of brain tumor.

Clay Sherman Merriman, Kansas City, Mo.; University Medical College of Kansas City, 1887; member of the American Medical Association; served on the faculty of his alma mater; on the courtesy staff of Trinity Lutheran Hospital; died January 5, aged 88, of arteriosclerosis.

James Middleton ● Arlington, Va.; University Medical College of Kansas City, Mo., 1898; an Associate Fellow of the American Medical Association; member of the Missouri State Medical Association; served during World War I; died January 23, aged 75.

Alfred Moore, Memphis, Tenn.; Memphis Hospital Medical College, 1895; past president of the Memphis and Shelby County Medical Society; served as vice president of the Tennessee State Medical Association; member of the medical advisory board during World War I; for many years on the staff of St. Joseph's Hospital; died January 6, aged 77, of cerebral hemorrhage.

Ethel Belle Perry ● Belfast, N. Y.; Rush Medical College, Chicago, 1923; local health officer and school physician; served on the staff of the Cuba (N. Y.) Memorial Hospital; formerly managing editor of the *Journal of Infectious Diseases;* died January 17, aged 62, of carcinoma of the sigmoid.

Albert Baldwin Pitkin ● New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1918; an examiner for the local induction service during World War II; served on the staff of Touro Infirmary, where he died January 14, aged 53, of coronary occlusion, cerebral embolism and pulmonary infarction.

Harwood Hugo Ritter, Charleston, W. Va.; University of Virginia Department of Medicine, Charlottesville, 1935; member of the American Medical Association; fellow of the American College of Surgeons; died January 29, aged 38, of heart disease.

Robert Redvers Scott, Scottsville, Mich.; University of Michigan Medical School, Ann Arbor, 1924; member of the American Medical Association; served during World War I; formerly county health officer; affiliated with Paulina Stearns Hospital in Ludington; died January 12, aged 49, of coronary occlusion.

James V. Smith, Henrietta, Mo.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1902; visiting surgeon at the Research Hospital in Kansas City; died January 13, aged 74, of arteriosclerosis.

Oda Oscar Smith, St. Louis; Washington University School of Medicine, St. Louis, 1911; member of the American Medical Association; died January 1, aged 66, of heart disease.

Archibald Blythe Thompson ● Grand Rapids, Mich.; L.R.C.P., L.R.C.S., Edinburgh and L.R.F. of P.&S. of Glasgow, 1887; an Associate Fellow of the American Medical Association; died January 19, aged 84, of lymphosarcoma of the stomach.

Morris Clayton Thrush ● Philadelphia; Medico-Chirurgical College of Philadelphia, 1901; also a pharmacist; served during World War I; died January 17, aged 73, of cerebral thrombosis.

Wilford Lloyd Thunhurst, Wilkinsburg, Pa.; University of Pittsburgh School of Medicine, 1909; member of the American Medical Association; died January 5, aged 62, of hypertensive heart disease and nephritis.

Homer Bowen Wilcox ● Kingston, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1901; an Associate Fellow of the American Medical Association; member of the American Urological Association; fellow of the American College of Surgeons; served as chief of the urologic department, Wilkes Barre (Pa.) General Hospital; died January 9, aged 72, of coronary sclerosis.

V 1
195

Foreign Letters

PARIS

(From a Regular Correspondent)

Jan. 10, 1950.

Congress of French Society of Otorhinolaryngology

The Congress of the French Society of Otorhinolaryngology took place Oct. 17-21, 1949 in the Great Lecture Hall of the Paris Faculty of Medicine under the presidency of A. Bloch and the honorary presidency of Dean Léon Binet. It was attended by numerous French members and foreign representatives from Great Britain, Holland, Italy, Greece, Spain, Switzerland, the United States and South America. A. Soulas, H. Guillon and G. Arnard (Paris) and P. Mounier-Kuhn (Lyons, France) reported on the use of streptomycin in otorhinolaryngology and bronchology; they showed by 150 histories that the major indication for its use is laryngopharyngeal tuberculosis. The best results are obtained with a total dose of 40 to 80 Gm. given at the daily rate of 0.5 to 3 Gm., an average dose of 1.5 Gm. The effect is less noticeable in tracheobronchial tuberculosis; the evolution of auricular tuberculosis treated with the help of streptomycin is more rapid, and cicatrization is better.

The authors also dealt with incidents and accidents of streptomycin therapy; experimental and clinical studies, especially those of de Causse, have shown that if peripheral sensory lesions are predominating it is impossible to ignore the existence of lesions of the central nervous system. Total deafness, rarer than it was believed to be in the past, has especially been observed in meningitic patients. Vestibular disorders occur less frequently in young subjects and are in direct relation to the dosage of streptomycin and the duration of the treatment. According to observations of N. R. H. Blegvad (Copenhagen, Denmark), of 200 patients, 30 per cent of those with hyperreflexia resume normal functioning; of 15 with areflexia, 11 remained in the same condition, 3 recuperated with reduced functioning and 1 returned to normal. The author is of the opinion that when the daily dose is 1 Gm. the danger of damage to the vestibular organ is slight.

From their data on the predominance of central lesions, Lapouge, Rivoire and Aubert (Nice) insist on use of the encephalographic method, which permits the study of the cortical activity at the time of the labyrinthine stimulation. M. Aubry, R. Bourgeois, J. J. Debain and Jacques Rouget, in their report on "the channel of approach to the middle ear," stress that the surgical problem is not one of choosing between the three main channels—retroauricular, endaural and preauricular—but between preservation or ablation of the incus. A. Moulonguet and J. Bouche have described their technic for the surgical treatment of bilateral laryngeal paralysis in adduction based on an arytenoidectomy by external transthyroid channel with fixation outside of the vocal cord.

Moulonguet also presented his statistics on 104 patients with total laryngectomy performed with his technic, shown in an instructional film. Pure laryngectomies caused a mortality of 1.56 per cent, pharyngolaryngectomies 9.5 per cent. Professor E. Bozzi and P. C. Cova (Milan, Italy) have shown by their results that the stratigraphic method is particularly interesting for the detection of lymphatic formations on the posterior and anterior walls of the nasopharyngeal cavum. Godin (Brussels, Belgium) recommended periarterial infiltrations at the level of the external branch of the carotid, which are specially indicated in certain edemas of the nasal mucosa, rhinorrhea of hypertensive patients, certain spasms of anterior ethmoidal arteries and the angiospastic form of spasmodic coryza. L. W. B. Jongkees (Utrecht, Netherlands) presented a statistical study of 100 cases of operation for otosclerosis. He noted that hearing of the nonoperated ear was improved in 27 per cent of the cases. In 2 cases it improved despite a negative result on the operated ear. R. Mayoux and C. Chossegros (Lyons) stressed the necessity for long-continued treatment of endonasal lupus with Charpy's method and minute control of patients. Repeated histologic examinations have shown in 57 per cent of the subjects the persistence of an inflammatory infiltrate of the lymphoplasmocytic type, though the mucosa had returned to normal. J. E. Sobieski (Paris) used the extract of Actinomyces griseus, obtained by triturating the mycelium itself in a mortar, in local applications in the case of ozena resistant to the bacteriophage. He also obtained interesting results in chronic otitis media and otitis externa (suppurative eczematoid dermatitis of the duct), maxillary sinusitis and vestibular folliculitis of the nose.

J. M. Le Mée presented H. G. Kobrak's (Chicago) synchronized color film on the mechanism of hearing in its normal state and in some pathologic conditions. Prof. A. Montandon (Geneva, Switzerland) showed a film on petromastoidal évidement through the endaural channel in chronic otitis. G. Hicquet and Van Eyck (Brussels, Belgium) showed another film on the surgical treatment of progressive deafness through otosclerosis and G. Portmann (Bordeaux) one on the surgical treatment of cancer of the deep regions of the face.

Succinic Dinitrile in Psychiatry

Prof. J. Delay (Clinics of Mental and Encephalic Diseases of the Paris Faculty of Medicine), P. Sizaret, P. Deniker and B. Lainé studied malononitrile for one year, employing it according to the technic of Swedish investigators. In 4 cases of long-standing schizophrenia they noted modification of temper and behavior during the malononitrile stage, which in 2 cases persisted for some time, but they did not obtain recovery or real improvement. They have abandoned it because of its toxicity and have undertaken pharmacodynamic researches with the oxalic, malonic, succinic and pyrotartaric acid dinitriles to find a less toxic agent, less delicate to handle. Oxalonitrile is unstable; its toxicity is greater than that of malononitrile; pyrotartaric nitrile has such a feeble pharmacodynamic activity that it should be used in the pure form and in large doses. The authors have retained succinic acid dinitrile ($CN\text{-}CH_2\text{-}CH_2\text{-}CN$) because its toxicity is more constant in various animals (mammals, birds and batrachians) and 6 to 10 times less toxic than the malononitrile. Its preparation is easier and its preservation better than that of malononitrile.

After experimenting, the authors arrived at an almost standard dose of 20 cg. per injection, representing about 4 mg. per kilogram of body weight. A large dose causes signs of intoxication and necessitates the administration of sodium thiosulfate, but the authors prefer it to a smaller dose because it has a more lasting effect. Injections were given intravenously every other day, although a few subjects received intramuscular injections. The first results led the authors to use succinic acid dinitrile in depressive states and in certain hypochondriac or cenesthopathic conditions with anxiety and atypical depressions. Of 12 patients, 5 were discharged as cured after treatment comprising five to twelve injections over a period of two weeks to one month; 4 were much improved after five to eight injections; of 3 improved patients, 1 with severe involutional depression was sufficiently improved after six injections to permit probational discharge. In 3 of these patients electroshock therapy had failed. Tolerance to the drug has been satisfactory regardless of mode of administration, and an injection of sodium thiosulfate has not been necessary. A few hours after the injection, a slight congestion of the face appears, although neither pulse nor tension show any noticeable modification. Some patients reported a feeling of drowsiness in the course of the

day. One of the authors stated, after experiment on himself, that succinic acid dinitrile in therapeutic doses appears harmless; he experienced only slight cephalea within a few hours after injection of the drug. It has not yet been possible to define the mode of action of this substance. It does not seem to act as shock therapy.

As the authors emphasize in their communication (published in *La semaine des hôpitaux de Paris*, Dec. 26, 1949, p. 3959), the value of succinic acid dinitrile resides in its use in depressed conditions the intensity of which does not justify hospitalization or electroshock therapy. The authors are pursuing their studies on the use of this chemical alone or associated with other treatment.

ITALY

(From a Regular Correspondent)

NAPLES, Dec. 31, 1949.

Oncologists Meet Under the Patronage of the Pope

An important oncologic meeting was held in Italy this year under the auspices of Pope Pius XII while preparations were in full swing for the Holy Year, the celebration of which began December 24. The congress took place in Vatican City, in a room of the Casina of Pius IV, a beautiful building with historic and artistic memories of ancient culture. The invited physicians were: John Bittner of Minneapolis; J. P. Greenstein of Bethesda, Md.; E. V. Cowdry of St. Louis; E. Boyland of London; Peacock of Glasgow, Scotland; Berenblum of England; A. Lacassagne of Paris, France; J. Sanz Ibanez of Madrid, Spain; J. Maisin of Louvain, Belgium; H. von Euler of Stockholm, Sweden, to whom was awarded the Nobel prize; H. R. Schinz of Zurich, Switzerland; P. Rondoni of Milan, and F. Pentimalli of Naples. The congress was opened at the Pontifical Academy of Science under the chairmanship of Fr. Agostino Gemelli, rector of the Catholic University of the Sacred Heart in Milan. The sessions took place under the chairmanship of Dr. Rondoni, director of the Cancer Institute of Milan.

Professor Rondoni reported on the two aspects of the "mechanism of action of the carcinogenic hydrocarbons." With regard to the first aspect, the relation between cancerogenic activity and the in vivo and in vitro reacting capacity of the sulfhydryl groups, he concluded that the hydrocarbons, which in general are not cancerogenic, do not inhibit proteolysis but that experimentally the cancerogenic substances more or less inhibit proteolysis, reacting with cysteine in the function of the activator (in some experiments also with 2,3 dimercaptopropanol [BAL]). The second aspect of the cancerogenic function of some hydrocarbons was explained on the basis of the electronic theory according to O. Schmidt (Pullman, Pacault) by a disturbance of the electronic intracellular distribution. The electronic concept was discussed by A. and B. Pullman at the International Congress of Cancer in St. Louis in September 1947.

Prof. E. V. Cowdry presented a study of the transformation of the normal cutis into an epithelioma in a report with the title: Properties of Cutaneous Cancer Confronted with a Cell of Normal Epidermis. Professor Berenblum presented a critical note on the factors which favor carcinogenesis. He reported experiments with croton oil made in collaboration with his pupils. Peacock discussed factors which influence the reaction of tissue to cancerogenic hydrocarbons. For him antipyrine benzoate dissolved in tricaprin (a compound of capric acid and glycerin, glyceryl tricaprate) remains at the seat of the injection in an amount which diminishes progressively during the latent period of the sarcomatous induction. There is not yet any reliable evidence which could demonstrate whether in the induction of sarcoma the antipyrine benzoate acts by itself or by means of its metabolites. Boyland stated in his report on the biochemics of cancerogenesis that hydrocarbons interfere with protein metabolism.

RESEARCH ON CANCER

Prof. A. Lacassagne reported on the polycyclic hydrocarbons as cancerogenic agents. He said that the malignant transformation may be the result of destruction of the mechanisms which regulate the multiplication of cells. The new character thus acquired by the cell (unlimited power of multiplication within the organism) is the only one which shows itself constant and consequently specific of the cancerous cell as compared with the normal cell.

The report by Jesse P. Greenstein on the enzymatic characteristics of tumors and of the host carrier of the tumor met with great success. According to Greenstein, the tumors have a uniform enzymatic pattern in contrast to the highly variable pattern of any normal tissue. The normal tissues of the host carrier of the tumors, particularly those of the liver, at once undergo chemical changes in a certain direction by which the tissues become cancerous. Von Euler, a Nobel prize winner, reported on the action of normal and of sarcomatous serum on tumor cells. Roentgenologist Schinz of Zurich discussed some instances of cancerous mitosis. Professors Sanz Ibanez and Maisin spoke about styryl 430 (2-[para-aminostyryl]-6-[para-acetylaminobenzoylamino]-N-methylquinonlinium acetate) in experimental cancerogenesis. The paper by Professor Bittner on the etiology of cancer of the breast in mice dealt with the famous "milky virus" which may act as a cancerogenic agent in association with hereditary endocrinologic factors (ovarian, pituitary and adrenal). Professor Pentimalli confirmed his original point of view on the enzymatic nature of the cancerogenic virus; he considered that one may have to deal with a ferment which activates a synthesis, but not a destruction, of protein. Protein synthesis is in fact the fundamental phenomenon which is indispensable for the growth of the tumor.

His Holiness Pius XII wanted to express personally to each of the famous guests his satisfaction with the papers presented during the congress.

BRAZIL

(From a Regular Correspondent)

SÃO PAULO, Dec. 28, 1949.

Technic and Accidents of Psychosurgery

In the Hospital do Juqueri, Dr. Antonio Carlos Barreto operated on 418 patients from 1943 to June 1948; 210 of these operations were done by the Egas Moniz technic and 208 by the Freeman-Watts lobotomy or modified technic. Some patients who had not been helped by Moniz's operation were subjected to lobotomy. Several patients were operated on more than once by the Freeman-Watts bilateral lobotomy. Others were subjected to lobotomy in quadrants (one, two or three times), with intervals of one or more months. In 10 patients on whom Moniz's technic was not successful Barreto also performed alcoholization within the white matter of the prefrontal lobe. At first Dr. Barreto carried out lobotomy with Killian's periosteal elevator, but now he uses a new instrument. The instrument consists of a trocar slightly flattened so that it looks like a regular leukotome with one of the ends sealed. In one of the severing edges near the blind end there are four small holes, 1 cm. apart. Through the free end the liquor may be easily drawn off by means of a syringe and the contrast may be injected into the section surface. To secure a better plan of section Dr. Barreto followed the technic of transfixing the falx with a stylet inserted through the burr holes. He recommends systematic pneumoencephalographs before operation to localize the ventricles. There were 6 deaths, the causes of which were hemorrhage during the operation (2 patients), purulent meningitis (1) and sunstroke (1). The epileptic patients died in "status epilepticus" three weeks after prefrontal lobotomy of one side.

V 1
195

Inhibition of Schistosoma Mansoni Ovulation

According to experimental studies carried on by Drs. Barros Coelho, Humberto Menezes and Ageu Magalhaes Filho, the antimonial salt (antimony sodium tartrate) produces inhibition of Schistosoma mansoni ovulation in guinea pigs. The body of dead worms (by medicamentous action) produces nodular formation with or without parenchymatous necrosis. The necrotic nodules appear when the worm comes directly into the parenchyma, because of the breakage of the vascular walls. The nodules without necrosis are those formed when decomposed matter of the dead worm enters the vascular lumen of a portal branch with productive endophlebitis. In these cases the products of decomposition cannot reach the parenchyma, because of a wall built by endophlebic granulomatous tissue and preserved muscularis layers.

The portal spaces with cicatricial nodules show newly formed bile ducts and venous capillaries and moderate fibrous proliferation. Some fibrous trabeculae, beginning from these spaces, can reach the Glisson's capsule, causing retraction of the liver surface.

Limitations of Gastrointestinal Intubation

In a recent article Dr. Sylvio Levy called attention to the value and limitations of the use of the Miller-Abbott tube in colonic surgery. In acute obstruction the preoperative intubation will be useful and beneficial to the patient, since there is simultaneous distention of the small bowel due to back flow through the ileocecal valve or paralytic obstruction of the intestines. In the event of colonic distention with a continent ileocecal valve, the preoperative intubation will be useless if it reaches the cecum.

Dr. Levy pointed out that obstruction by strangulation is serious because of the vascular disturbances it causes and requires urgent radical surgical intervention, as improvement cannot be expected from intubation. A summary of 5 cases was given as proof. The importance of intubation in the preoperative treatment in colonic surgery in general is great. It should be used simultaneously with other operative measures that effect general improvement of the patient. Its usefulness in relation to right hemicolectomy was emphasized.

COLOMBIA

(From a Regular Correspondent)

Dec. 20, 1949.

Scurvy

Dr. Calixto Torres Umaña recently gave a lecture at the National Academy of Medicine of Bogotá on his observations on patients with Moeller-Barlow's disease in Bogotá. Scurvy in children is rare in Bogotá and in the entire intertropical region. The speaker explained the lack of frequency of the disease by various hypotheses. One is that the milk of cows of the tropical region is immensely rich in vitamin C because the cows feed on green pasture throughout the year, whereas the cows of nontropical zones are fed with dry hay during winter. Moreover, scurvy is not observed even in the children of the poor families of Bogotá that have food containing a scanty amount of ascorbic acid. Another hypothesis is that vitamin C can be synthesized by the sun's rays in the blood of children in the tropical countries. However, examinations of children of poor families in the country showed that the amount of ascorbic acid in their blood is small. Guillermo Tovar Escovar of Caracas has previously reported the same results in a similar research. It is probable that vitamin C can be replaced by an unknown substance. This hypothesis agrees with the results of Blair and Baley's researches. The authors found that the capillary permeability increases in winter, although the authors explain the fact as if there were other causal factors. The hypothesis agrees also with the results of Dalldorf's researches. The author believes that scurvy can be prevented by other unknown factors as it is prevented by vitamin C. Dr. Torres Umaña carried on experiments in children and in guinea pigs given diets without vitamin C. Guinea pigs on this diet which were out in daylight were more resistant to the development of scurvy than those which were kept in darkness. However, the disease developed in all the animals. None of the children who were out in daylight suffered with scurvy, even after the disappearance of vitamin C in the blood and the constant presence of ascorbinemia for fourteen months. Those in darkness showed some symptoms of scurvy. The results show that, in tropical countries, some unknown factors replace vitamin C in the prevention of Barlow's disease. Because vitamin P has an influence on capillary permeability, experiments were conducted on guinea pigs. Four guinea pigs were given a diet without vitamin C. They had 4 mg. of vitamin P daily and were left in darkness. At the end of the experiment all the animals died. Two animals presented symptoms of scurvy before the other 2 and were then put in daylight; they survived the 2 left in darkness a short period of time. The results suggest that vitamin P does not prevent scurvy in guinea pigs. However, it is advisable to carry on further researches to ascertain that vitamin P does not prevent scurvy in children and also that an unknown factor, which is probably synthesized by sunlight, prevents the disease in the tropical countries.

Medical Reunion in Cali

The Medical Reunion, which was organized by the Federación Médica Colombiana, was held Oct. 29-31, 1949, at Cali city. More than 300 members of the medical profession of Colombia attended. The main topic was the position of the medical profession in social insurance, as the latter has been recently started in Colombia. The following items were agreed on: 1. The members of the medical profession of Colombia will collaborate with the Instituto Colombiano de Seguros Sociales (Institution of Social Insurance in Colombia), provided the institution does not turn to total socialization of medicine. If it does, the profession will discontinue cooperation. 2. The medical profession will analyze the laws by which social insurance is regulated. It will request that the government make changes to offset provisions harmful to the medical profession. 3. It is advised that members in the various branches of medicine and its allied professions be unified with respect to the resolutions of the medical profession concerning this problem.

A new board of directors of the federation was appointed: Drs. José del Carmen Acosta, president, and Gustavo Esguerra Serrano, Jorge Díaz Guerrero, César Augusto Pantoja, Rafael López Ruiz, Alfonso Uribe Uribe and Gonzalo Reyes García.

Treatment of Schizophrenia by Acetylcholine

Dr. Angel Octavio Villar, following studies carried on by Dr. A. M. Fiamberti, used acetylcholine in schizophrenia in 30 patients in the Asylum for Schizophrenic Women in Bogotá. A 10 per cent acetylcholine solution, containing sufficient acetylcholine to produce shock, was used. It was rapidly injected intravenously. The dose necessary to produce so-called vascular shock varies between 0.30 and 0.60 cg. of acetylcholine. The injection was repeated three times a week until 10 to 40 injections had been given. Total remission was obtained in 15 patients (50 per cent). The author advises the use of acetylcholine in various types of psychoses. The shock produced is shorter and less spectacular than that produced either by electroshock or by pentamethylenetetrazole. Patients are less fearful of acetylcholine shock than of either of the other two types of shock. The best results are obtained from early therapy.

Correspondence

PRURITUS AND JAUNDICE

To the Editor:—In response to the communication of Dr. Irving Brick of Washington, D. C., which appeared in THE JOURNAL (142: 198 [Jan. 21] 1950), I should like to state that it is unfortunate that Dr. Brick did not correctly evaluate the part of my article which pertained to pruritus and jaundice. It is difficult to understand why Dr. Brick stated that I "claimed" that pruritus is "pathognomonic" of extrahepatic obstruction. Nowhere in my article does the word "pathognomonic" appear, and nowhere was such a "claim" made. I stated that when the pruritus was the primary complaint I felt quite positive that there was an obstruction in the extrahepatic passages. This does not imply that pruritus of a lesser degree cannot be associated with another type of jaundice, nor does it imply that quite positive is synonymous with pathognomonic.

Dr. Brick quoted Rothman and Shapiro (in MacBryde, C. M.: Signs and Symptoms, Philadelphia, J. B. Lippincott Company, 1947, p. 384) as stating that pruritus may occur in jaundice of any sort. In my article I also mentioned the same possibility of itching occurring in intrahepatic jaundice. Rothman and Shapiro also classify jaundice according to its intensity. I stressed this same point when I stated that I considered itching the primary complaint in the posthepatic jaundiced patient and that rarely does a patient with intrahepatic jaundice complain of itching. It is unfortunate that my use of "primary" was not noticed.

Dr. Brick's reference to Colbert (*Bull. U. S. Army M. Dept.* 8: 954, 1949) also was reported in a rather misleading fashion. Colbert stated that 16 of 75 patients (only 21.3 per cent) with infectious hepatitis complained of pruritus. However, Dr. Brick failed to mention that the same author in the same article stated that 60 per cent of patients with obstructive jaundice caused by stones had pruritus and that 75 per cent of a group of jaundiced patients with biliary obstruction caused by neoplasms complained of itching. These figures of much higher percentage in the posthepatic jaundiced patient should have been mentioned. Colbert further stated that the pruritus of infectious hepatitis was not severe.

Dr. Brick referred to Hoagland and Shank (J. A. M. A. 130: 615 [March 9] 1946) as stating that 46.5 per cent of 200 patients with infectious hepatitis had pruritus in the preicteric phase. This figure was taken from a table wherein no comment was made as to the degree of severity; these authors stated: "Pruritus of all degrees of severity occurred in 46 per cent of cases."

Apparently all of the forementioned authors, cited by Dr. Brick, commented on the degree of intensity of the itching, which important point was overlooked in his letter.

For future study regarding the importance of pruritus as a primary complaint in posthepatic jaundice I should like to refer to a voluminous literature, starting in 1885 with Murchison (A Clinical Lecture on Diseases of the Liver, ed. 3, London, Longmans, Green and Co., 1885, p. 544), who in speaking of pruritus stated that it "has been found but rarely except in obstruction of the common duct," and continuing with Schiff (Differential Diagnosis of Jaundice, Chicago, The Yearbook Publishers, Inc., 1946, p. 42), who in 1946 stated, "On the whole pruritus seems to occur infrequently and it is not a prominent symptom in patients with acute hepatitis; this is certainly borne out by the experience of many physicians in civilian practice."

I have never said, read nor heard of anyone's believing or even intimating that pruritus per se in the jaundiced patient was the sole indication for surgical intervention. One wonders whether Dr. Brick read the following passage in my article, "In evaluation of the diagnostic possibilities in each case nothing can replace the recording of a careful and accurate history. A detailed and keen physical examination is equally revealing." I believe that the factual data observed by clinicians is as important, if not more so, than some of the conflicting statistics which one reads.

PHILIP THOREK, M.D., Chicago.

PAUL EHRLICH INSTITUTE

To the Editor:—The existence of the research institutes founded for Paul Ehrlich is endangered. In spite of serious difficulties, we have succeeded in maintaining the Staatliche Anstalt für experimentelle Therapie, the present Paul-Ehrlich-Institut, and the Chemotherapeutisches Forschungsinstitut Georg-Speyer-Haus during periods of revolutionary changes and in making it possible for the institutions to continue in their tasks. Even after destruction of large sections of the buildings, work proceeded. However, our hope that after the war these world-renowned research institutes would approach a new age has not been fulfilled yet.

The conditions of the postwar period were such that we could not reestablish the work of Paul Ehrlich. All means to rebuild the destroyed sections of the Paul-Ehrlich-Institut were lacking, and the foundation funds of the Chemotherapeutisches Forschungsinstitut Georg-Speyer-Haus have been almost wiped out by deficit and currency reform.

To save the existence and preserve the activity of the institutions from which came forth arsphenamine (Salvarsan) and which are known throughout the world as the birthplace of modern chemotherapeutics, to have them arise again in the spirit of the great Paul Ehrlich and for the benefit of scientific research work we are taking the liberty of asking you to assist us in the reestablishment of these institutes and in the maintenance of their research work. At this time a request for help is being circulated with the signatures of many internationally known scientists, among them the Nobel prizewinners Adolf Butenandt, Tübingen; Hans von Euler, Stockholm; Otto Hahn, Göttingen; W. R. Hess, Zürich; C. Heymans, Gent; Paul Karrer, Zürich, and the daughters of Paul Ehrlich, Mrs. Marianne Landau and Mrs. Stefanie Schwerin, both of New York. We appeal to American surgeons for help and ask you to assist us in maintaining the institutes of Paul Ehrlich.

PROF. R. PRIGGE,
Paul-Ehrlich-Institut,
Frankfurt am Main-Söd 10,
American Zone, Germany.

INTRA-ARTERIAL TRANSFUSION

To the Editor:—In THE JOURNAL of Feb. 4, 1950, page 348, under Government Services, Army, Personal, appears the statement: "According to a release from Walter Reed Hospital, the administration of blood to overcome or prevent shock and circulatory collapse was first performed in the United States by Colonel Seeley in 1939."

I regret that the word "intra-arterially" did not appear after the word "blood" in the press release from this hospital. I hasten to correct the impression that the administration of blood for this purpose was introduced by me in this country. The intra-arterial administration, so far as I am able to determine, was first performed in the United States by me at this hospital in 1939.

COL. SAM F. SEELEY, M.C., Washington, D. C.

Miscellany

OPPORTUNITIES FOR CIVILIANS IN THE PACIFIC ISLANDS

The President has decided that administrative responsibility for Guam and American Samoa, which are United States possessions, and for the Trust Territory of the Pacific Islands, which comprises the former Japanese mandated Marshall, Caroline and Mariana Islands, will be transferred from the Navy Department to the Department of the Interior. An Executive Order makes this transfer of responsibility effective on Guam on July 1, 1950. The transfer in American Samoa and the Trust Territory is scheduled to take place on July 1, 1951.

It is planned that naval officers and enlisted personnel serving in these island governments will be replaced with civilians before the transfer dates. Each island area has hospital facilities, small island or village dispensaries and public health organizations. Medical work in these islands, in view of the great need for health services, the varied nature of medical problems and the differing cultures of the people, offers an important challenge to physicians and other medical personnel.

Guam has a population of about 75,000, of whom 27,000 are Guamanians. The Guam Memorial Hospital, a temporary structure with 250 beds, including tuberculosis wards and a staff of nine medical officers, serves primarily the Guamanian population. It is operated by the Guam government and shares some facilities in common with the adjoining naval hospital. In this medical center are schools for native medical assistants, dental assistants and nurses, which are attended by Guamanians, Samoans and Trust Territory islanders. It has been planned that a permanent, fully equipped hospital will be built for civilians in Guam in the near future.

American Samoa has a population of over 19,000, almost all of whom are Samoans. The island government maintains a 200 bed hospital, built in 1945-1946, and a staff of five medical officers. Since 1912 a training school for Samoan registered nurses has been in operation.

The Trust Territory has been under American administration since the occupation of the islands during and after World War II. The territorial government has established six 50 to 75 bed general dispensaries, each with a staff of two or three medical officers. These hospitals or dispensaries are located at Saipan in the Marianas, Yap and Koror in the Western Carolines, Truk and Ponape in the Eastern Carolines, and Majuro in the Marshalls. In the smaller islands health work is cared for by native health and nurse aides. A small leprosarium is maintained at Tinian in the Marianas.

In establishing medical positions for the governments of these three areas, the Department of the Interior will follow federal classifications, but applicants need not be on a Civil Service register to be eligible for appointment. Positions for physicians, public health officers, hospital administrators, laboratory technicians, pharmacy technicians and nurses are available. Salaries for physicians will range from $6,400 to $8,800 per annum. A post differential of 25 per cent in addition to salary is allowed at present for employees stationed in the islands. Transportation is paid for employees and their dependents. Housing is excellent in Samoa and is adequate for tropical conditions in Guam and the Trust Territory, where it is of an advanced base type. Houses are furnished and rents are reasonable.

Information regarding opportunities for health work in the Pacific Islands can be obtained from the Division of Territories and Island Possessions, Department of the Interior, Washington 25, D. C.

Council on Medical Education and Hospitals

NEW HOSPITALS REGISTERED

The following hospitals were registered by the Council on Medical Education and Hospitals of the American Medical Association at its meeting in Chicago, Feb. 8, 1950:

Tombstone General Hospital, Tombstone, Ariz.
LaFayette County Memorial Hospital, Lewisville, Ark.
Santa Marta Hospital and Clinic, Los Angeles.
Mater Misericordiae Hospital, Merced, Calif.
Ingleside Lodge, Wilmar, Calif.
Phillips County Hospital, Holyoke, Colo.
South Lake Memorial Hospital, Clermont, Fla.
Bailust Point Manor, Tampa, Fla.
Baldwin's Hospital, West Palm Beach, Fla.
Tanner Memorial Hospital, Carrollton, Ga.
Howell-Quillian Clinic-Hospital, Cartersville, Ga.
Mary Alice Hospital, Cumming, Ga.
Gooding Memorial Hospital, Gooding, Idaho
Steele Memorial Hospital, Salmon, Idaho
St. Monica's Hall, Springfield, Ill.
Clinic Hospital, Glasgow, Ky.
Church Point Sanitarium, Church Point, La.
Martin's Sanitarium, Donaldsonville, La.
Ruston Tuberculosis Hospital, Ruston, La.
Memorial Hospital, Van Dyke, Mich.
Belgrade Community Hospital, Belgrade, Minn.
Ely-Winton Memorial Hospital, Ely, Minn.
Morrill County Veterans Memorial Hospital, Bridgeport, Neb.
Gordon Hospital, Gordon, Neb.
Kessler Institute for Rehabilitation, West Orange, N. J.
Grant County General Hospital, Silver City, N. Mex.
Veterans Administration Hospital, Buffalo, N. Y.
Dorothy Carolyn Hospital, Bakersville, N. C.
West Harper Clinic-Hospital, Lenoir, N. C.
Neil Training School, Columbus, Ohio
Guymon Municipal Hospital, Guymon, Okla.
Kensington Hospital, Philadelphia
Hand County Memorial Hospital, Miller, S. Dak.
Fountain Head Sanitarium and Hospital, Fountain Head, Tenn.
West Tennessee Tuberculosis Hospital, Memphis, Tenn.
Floresville Hospital, Floresville, Texas
Searcy-Fleming Clinic and Hospital, Hearne, Texas
Pauline Sterne Wolff Memorial Home, Houston, Texas
Mask Clinic and Hospital, Jacksboro, Texas
Corso Obstetrical Hospital, Livingston, Texas
Medical and Surgical Clinic-Hospital, Longview, Texas
Rockport Hospital-Clinic, Rockport, Texas
General Clinic-Hospital, San Antonio, Texas
Seminole General Hospital-Clinic, Seminole, Texas
Timpson Clinic Hospital, Timpson, Texas
Memorial Hospital, Uvalde, Texas
St. Benedict Community Hospital, Durand, Wis.
Washakie Memorial Hospital, Worland, Wyo.
Ramirez Hospital, Mayaguez, P. R.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various locations, July 21. *Oral.* Philadelphia, April 23-27, Chicago, Oct. 8-11. Sec., Dr. Curtiss B. Hickcox, 745 Fifth Ave., New York 22.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Washington, April 14-16. Sec., Dr. George M. Lewis, 66th Street, New York 21.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* Boston, April 13-15. San Francisco, June 21-23. The oral examinations in the subspecialties will be held at the same times and places. Asst. Sec., Dr. William A. Werrell, 1 West Main Street, Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral.* Chicago, June 3. Sec., Dr. W. J. German, 789 Howard Ave., New Haven, Conn.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY, Inc. *Oral Part II.* Atlantic City, May 21-28. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various Centers, January 1951. Final date for filing applications is July 1, 1950. *Practical.* Boston, May 22-26; Chicago, Oct. 2-6; West Coast, Jan. 1951. Sec., Dr. Edwin B. Dunphy, 56 Ivie Road, Cape Cottage, Maine.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral.* San Francisco, May. Chicago, October. Sec., Dr. Dean M. Lierle, University Hospital, Iowa City.

AMERICAN BOARD OF PATHOLOGY: Madison, Wis., April 11-12. St. Louis, Nov. 10-11. Sec., Dr. Robert A. Moore, 507 Euclid Ave., St. Louis.

AMERICAN BOARD OF PEDIATRICS: Philadelphia, March 31-April 2; Cincinnati, May 5-7; San Francisco, June 30-July 2. Exec. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Oral and Written.* Boston, Aug. 26-27. Final date for filing applications is April 1. Sec., Dr. Robert L. Bennett, Georgia Warm Springs Foundation, Warm Springs, Ga.

AMERICAN BOARD OF PLASTIC SURGERY: *Oral.* May-June. Sec., Dr. Louis T. Byars, 4647 Pershing Avenue, St. Louis, Mo.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Spring Examination. Sec., Dr. F. J. Braceland, 102-110 Second Ave., S.W., Rochester, Minnesota.

AMERICAN BOARD OF RADIOLOGY: *Oral.* Chicago, week of June 12. Sec., Dr. B. R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written.* Various centers, Oct. 25. Final date for filing applications is July 1. Sec., Dr. J. Stewart Rodman, 225 South 15th Street, Philadelphia.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 27-29. Sec., Dr. D. G. Gill, 519 Dexter Avenue, Montgomery.

ARKANSAS: * *Examination.* Little Rock, June 8-9. Sec., Dr. Joe Verser, Harrisburg. *Eclectic.* Little Rock, June 8-9. Sec., Dr. Clarence H. Young, 1415 Main Street, Little Rock.

CALIFORNIA: *Examination, Written.* San Francisco, June 19-22; Los Angeles, Aug. 21-24; Sacramento, Oct. 16-19. *Examination, Oral and Clinical for Foreign Medical School Graduates.* San Francisco, June 18; Los Angeles, Aug. 20; San Francisco, Nov. 12. *Reciprocity, Oral Examination.* San Francisco, June 17; Los Angeles, Aug. 19; San Francisco, Nov. 11. Sec., Dr. Frederick N. Scatena, 1020 N Street, Sacramento 14.

COLORADO: * *Reciprocity.* Denver, April 4. Final date for filing application is March 18. Sec., Dr. George H. Gillen, 831 Republic Building, Denver.

CONNECTICUT: * *Examination.* Hartford, March 14-15. Secretary to the Board, Dr. Creighton Barber, 160 St. Ronan Street, New Haven. *Homeopathic.* Derby, March 9-10. Sec., Dr. Donald A. Davis, 30 Elizabeth Street, Derby.

DELAWARE: *Examination.* Dover, July 11-13. Sec., Dr. J. S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: * *Reciprocity.* Washington, March 13. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

FLORIDA: * Jacksonville, June 25-27. Sec., Dr. Frank D. Gray, 12 N. Rosalind Avenue, Orlando.

GEORGIA: *Examination.* Atlanta and Augusta, June. *Endorsement.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta 3.

IDAHO: Boise, July 10. Sec., Mr. Armand L. Bird, 305 Sun Bldg., Boise.

ILLINOIS: Chicago, April 4-6. Superintendent of Registration, Mr. Charles F. Kervin, Capitol Bldg., Springfield.

INDIANA: *Examination.* Indianapolis, June. Sec., Dr. Paul R. Tindall, 1138 K of P Bldg., Indianapolis.

IOWA: * *Examination.* Iowa City, June 12-14. Sec., Dr. M. A. Royal, 506 Fleming Building, Des Moines 19.

KANSAS: Kansas City, June 7-8. Sec., Dr. J. F. Hassig, 905 N. 7th Street, Kansas City.

KENTUCKY: *Examination.* Louisville, June 14-16. Sec., Dr. Bruce Underwood, 620 S. 3rd Street, Louisville 2.

MAINE: Portland, March 14-15. Sec., Dr. Adam P. Leighton, 192 State Street, Portland.

MARYLAND: *Examination.* Baltimore, June 20-23. Sec., Dr. Lewis P. Gundry, 1211 Cathedral Street, Baltimore 1.

MASSACHUSETTS: *Examination.* Boston, March 14-17. Sec., Dr. George L. Schadt, 413 E. State House, Boston.

MONTANA: Helena, April 3-5. Sec., Dr. Otto G. Klein, First National Bank Building, Helena.

NEBRASKA: * *Examination.* Omaha, June 5-7. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Building, Lincoln 9.

NEVADA: Carson City, May 1. Sec., Dr. George H. Ross, 112 Curry Street, Carson City.

NEW JERSEY: *Examination.* Trenton, June 20-23. Sec., Dr. E. S. Hallinger, 28 West State Street, Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. Charles J. McGoey, Coronado Building, Santa Fe.

NORTH CAROLINA: *Endorsement.* Pinehurst, May 1. *Written.* Raleigh, June 19-22. *Endorsement.* Raleigh, June 19. Sec., Dr. Ivan Procter, 226 Hillsboro Street, Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 5-7. *Reciprocity.* Grand Forks, July 4. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Reciprocity.* Columbus, April 3. *Examination.* Columbus, June 14-17. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OKLAHOMA: * *Examination.* Oklahoma City, June 7-8. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

OREGON: *Endorsement.* Portland, April 28-29. *Written.* Portland, July. Exec. Sec., Mr. Howard I. Babbitt, 609 Failing Building, Portland 4.

RHODE ISLAND: * *Examination.* Providence, April 6-7. Chief, Division of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: *Examination.* Columbia, June 26-29. *Reciprocity.* First Monday of each month. Sec., Dr. N. B. Heyward, 1329 Blanding Street, Columbia.

TEXAS: * *Examination.* Austin, June 19-21. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

UTAH. *Examination.* Salt Lake City, June. Dir., Dr. Frank E. Lees, 324 State Capitol Building, Salt Lake City.

VIRGINIA: *Examination.* Richmond, June 23-24. *Endorsement.* Richmond, June 22. Sec., Dr. K. D. Graves, 631 First St., S.W., Roanoke.

WEST VIRGINIA: Charleston, April 3-5. Sec., Dr. N. H. Dyer, State Capitol, Charleston.

WISCONSIN: * Milwaukee, July 11-13. Sec., Dr. C. A. Dawson, River Falls.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: *Examination.* Tucson, March 21. Sec., Mr. Francis A. Ray, Science Hall, University of Arizona, Tucson.

ARKANSAS: *Examination.* Little Rock, May 9. Sec., Mr. L. E. Gehauer, 1002 Donaghey Building, Little Rock.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Building, Washington.

FLORIDA: *Examination.* June 3. Sec., Mr. M. W. Emmel, University of Florida, Gainesville.

IOWA: *Examination.* Des Moines, April 11. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

MINNESOTA: *Examination.* Minneapolis, April 4-5. Sec., Dr. Raymond M. Bleier, 109 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Examination,* Omaha, May 2-3. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

OKLAHOMA: *Examination.* Oklahoma City, April 11. Sec., Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City.

SOUTH DAKOTA: Vermillion, June 2-3. Sec., Dr. Gregg M. Evans, 310 E. 13th Street, Yankton.

TENNESSEE: *Examination.* Memphis, March 17-18. Sec., Dr. O. W. Hyman, 874 Union Avenue, Memphis.

TEXAS: *Examination.* Austin, April 21-22. Sec., Brother Raphael Wilson, 306 Nalle Building, Austin.

WISCONSIN: Madison, April 1. Milwaukee, June 3. Sec., Prof. W. H. Barber, Ripon.

Medical Motion Pictures

FILM REVIEW

Arytenoidectomy, Open Approach for Bilateral Abductor Paralysis. 16 mm., color, sound, showing time twelve minutes. Prepared under the direction of DeGraaf Woodman, M.D., Department of Otolaryngology, College of Physicians and Surgeons, Columbia University, New York. Produced in 1949 by and procurable on rental or purchase from Sturgis-Grant Productions, Inc., 314 East Forty-Sixth Street, New York 17.

This motion picture describes one of the operative technics for the repair of bilateral abductor paralysis of the larynx by means of an operation suggested by the author. The indication for the operation is illustrated by a direct recording giving an excellent interpretation of the patient's voice and her respiratory difficulty. A mirror view of the larynx shows the position of the vocal cords in adduction both on inspiration and phonation. The technic of the operation is then shown with particular stress placed on the author's technic of exposure of the arytenoid. The film ends with a series of direct sound recordings of the patient's voice and a mirror view of the larynx postoperatively.

In concept, the film is excellent. The indications for operation are given, and the appearance of the larynx preoperatively is an important feature of the film. This, followed by the surgical procedure and, finally, the postoperative recording of the voice and a view of the larynx gives a clear satisfactory presentation of the problem of bilateral recurrent laryngeal nerve paralysis. It is regrettable that the technical qualities of parts of the operation are not entirely satisfactory. Anatomic landmarks are often obscured by blood, and in a few scenes a closer view would have improved the teaching value of the film.

The film is recommended for otolaryngologists or for surgeons doing thyroid operations. It would have a limited use in county or state medical society meetings. It is unsatisfactory for medical students but would be of interest to residents and interns learning thyroid surgery as well as to residents in otolaryngology.

NEW MOTION PICTURES ADDED TO A. M. A. FILM LIBRARY

They Live Again. 16 mm., black and white, sound, showing time eleven minutes. Produced in 1939 by Metro-Goldwyn-Mayer. Procurable on loan (Service Charge $1) from the Committee on Medical Motion Pictures, American Medical Association, 535 North Dearborn Street, Chicago 10.

This short motion picture dramatizes, with professional actors, the story of the discovery of insulin by Banting and Best at the University of Toronto. The acting is excellent, and the plot is adequate to sustain the continued interest of most adult audiences. The entire handling is genuine, and few attempts to glamorize this story are made beyond its actual human significance. Enough is indicated of the history of diabetes before the discovery of insulin to give some appreciation of the far reaching importance of this discovery. It also points out that much experimentation was essential to this work and that investigators did not spare themselves or their medical friends in their effort to make the product available to humanity. The important role played in this story by the dog is dramatically and emotionally portrayed.

This film should have considerable teaching value in connection with science courses at high school or college level. It will be useful to scientific and professional groups in the fight for legislation favoring animal experimentation, and especially to physicians called on to explain the methods and importance of animal experimentation to community groups.

The photography, narration and direction are excellent.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in Continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1939 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 10 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

38:481-640 (Oct.) 1949

*Arterial Air Embolism. T. M. Durant, M. J. Oppenheimer, M. B. Webster and J. Long.—p. 481.
Idiopathic Infantile Hyperplastic and Hypertrophic Cardiomegaly (Congenital Cardiac Hypertrophy). G. G. Race and B. Blech-Schaffer.—p. 501.
Occurrence of Renin in Blood of Hypertensive Patients. E. Mylon and L. R. Freedman.—p. 509.
Heart Muscle and Electrocardiogram in Coronary Disease: I. Survey of Standards and Methods for Obtaining Anatomic Data Requisite for Clinicopathologic Correlation. W. F. Sheldon and J. J. Safyen.—p. 517.
*Relation of Cardiovascular Disease to Apoplexy: Review of 155 Cases with Autopsy. S. P. Hicks and B. K. Black.—p. 528.
Observations on Spatial Vectorcardiogram in Man. J. F. Conway, J. A. Cronvich and G. E. Burch.—p. 537.
Correlation of Electrocardiographic and Pathologic Findings in Posterior Infarction. G. B. Myers, H. A. Klein and T. Hiratzka.—p. 547.
Position of Precordial Leads: Anatomical Study. M. J. Rosenburg and C. M. Agress.—p. 593.
*Penicillin Therapy of Gonococcic Endocarditis: Case Report. V. J. Dorset, C. G. Spicknall and L. L. Terry.—p. 610.

Arterial Air Embolism.—According to Durant and coworkers, arterial air embolism is an infrequent but often disastrous complication of various thoracic therapeutic procedures. Occasionally it may result paradoxically from air entering the systemic veins and reaching the systemic arteries through a septal defect. The serious manifestations are the result of obstruction by air bubbles of cerebral and coronary vessels, together with spasm of these vessels induced by the irritation of the gas. Air was introduced experimentally into the coronary circulation of dogs by injecting it into the main trunk or into small branches of the left anterior descending coronary artery in 14 experiments and by injecting it into the pulmonary vein or left auricle in 4 additional experiments. Air introduced into the coronary circulation, either directly or by injection into the pulmonary vein or left auricle, produced ischemia of the myocardium in the area supplied by the involved vessels. The ischemia was demonstrable grossly and by electrocardiography. It may be temporary, with speedy recovery, or it may persist even after the apparent complete disappearance of the gas bubbles. Death from ventricular fibrillation may result within a short time after the injection of the air. The distribution of air within the arterial circulation is determined by the principle of air buoyancy. This principle may be made use of in the treatment of arterial air embolism by placing the patient in a position midway between left lateral and prone. To prevent cerebral embolism the patient should be placed head down. It is advisable to maintain this position for several hours. Reliance on this position should not exclude the use of other established principles in the treatment of air embolism.

Cardiovascular Disease and Apoplexy.—Hicks and Black studied the role of systemic circulatory failure in the production of apoplexy in 155 cases of cerebral vascular accident confirmed by necropsy in 99 men and 56 women. The apoplexy in all instances was the cause of death or a major factor in bringing it about. One hundred and eighteen patients had cerebral hemorrhage; 12 had infarction with thrombosis; 11 had infarction without thrombosis, and 14 had a ruptured aneurysm. Hypertension was present in nearly 90 per cent of the patients. Functional cerebrovascular disease, probably a spasm, appeared to be the important factor in most cases, while systemic circulatory failure accounted directly for few cerebral accidents. A cause and effect relationship was entertained in patients with cerebral aneurysm with hypertension.

Penicillin in Gonococcic Endocarditis.—Dorset and coworkers report 1 man aged 20 with gonococcic endocarditis which was believed to be superimposed on a deformed and incompetent mitral valve, a result of previous rheumatic heart. The latter was suggested by the patient's history of "joint trouble" at 10 years of age, and the persistence throughout the period of observation of an apical thrill and a harsh systolic mitral murmur with radiation to the left axilla. The diagnosis of gonococcic endocarditis was established by repeatedly positive blood cultures and the occurrence of embolic phenomena. Eight blood cultures made before the specific treatment showed growths of gram-negative diplococci which were bacteriologically identified as Neisseria gonorrhoeae. There were evidences of emboli to the right leg, left arm and spleen in the acute stages of the patient's illness. Specific therapy consisted of a total dose of 23.75 million units of penicillin and of a total dose of 62 Gm. of sulfadiazine. The strain of gonococcus was found to be moderately resistant to sulfadiazine. The drug, therefore, was discontinued after ten days' treatment. Penicillin was continued for thirty-one days and then was stopped because of the occurrence of fever, believed to be due to penicillin sensitivity. Treatment resulted in an apparent cure. The patient was followed for over seven months after the therapy was discontinued. No evidence of recurrence of gonococcic endocarditis was noted.

American Journal of Medicine, New York

7:437-568 (Oct.) 1949

Effects of Digoxin upon Heart and Circulation in Man: Digoxin in Left Ventricular Failure. R. M. Harvey, M. I. Ferrer, R. T. Catheart and others.—p. 439.
Coarctation of Aorta: Photo-Electric Plethysmography and Direct Arterial Blood Pressure Measurement as Aid in Diagnosis. M. L. Goldman and H. A. Schroeder.—p. 454.
Acute Coronary Insufficiency Due to Pulmonary Embolism. S. Dack, A. M. Master, H. Horn and others.—p. 464.
Auricular Fibrillation Without Other Evidence of Heart Disease: Cause of Reversible Heart Failure. E. Phillips and S. A. Levine.—p. 478.
Function of Kidney and Metabolic Changes in Cardiac Failure. E. V. Newman.—p. 490.
Tricuspid Stenosis—Simple Diagnostic Sign. H. Vassil.—p. 497.
*Diaphragmatic Hiatus Hernia with Severe Iron-Deficient Anemia. S. O. Schwartz and S. A. Blumenthal.—p. 501.
Biologic Complications of Penicillin Therapy. L. S. Sommer and C. B. Favour.—p. 511.
Aureomycin in Treatment of Tularemia. J. C. Ransmeier, H. J. Price and Z. B. Barnes Jr.—p. 518.

Diaphragmatic Hiatus Hernia with Anemia.—Schwartz and Blumenthal report studies on 20 patients with diaphragmatic hiatus hernia. The condition occurs chiefly in short, stocky, obese females, usually past middle age. With three exceptions all patients were past 50, and 12 of 20 were female. Bleeding from the stomach in these patients resulted in severe iron-deficient anemia. There was a paucity of symptoms directing attention to the gastrointestinal tract, but cardiovascular symptoms were prominent. The authors feel that if a woman past middle age has an iron-deficient anemia without a history of bleeding, localizing symptoms and significant physical findings, a diaphragmatic hiatus hernia should be suspected.

American Journal of Ophthalmology, Chicago

32:1317-1456 (Oct.) 1949

Experimental Ocular Histoplasmosis. R. Day.—p. 1317.
Histamine and Uveal Infiltration. T. F. Schlaegel Jr.—p. 1331.
Retinitis Pigmentosa Associated with Glaucoma. S. Gartner and A. Schlossman.—p. 1337.
Unilateral Retinitis Pigmentosa: Report of Case. D. M. Gordon.—p. 1350.
Ocular Manifestations of Primary Nasopharyngeal Tumors. D. C. Boyce and N. Bolker.—p. 1354.
Study of Effect of Retrobulbar Anesthesia on Ocular Tension and Vitreous Pressure. H. Gifford Jr.—p. 1359.
Choice of Miotic Agent Following Retrobulbar Anesthesia. H. G. Scheie and G. Ojera.—p. 1369.
Degrees of Correction Per Millimeter of Surgery. R. G. Scobee.—p. 1376.
Clinical Aspects of Sympathetic Ophthalmia. H. H. Joy.—p. 1383.
Ariboflavinosis with Case Report on Parenchymatous Keratitis Following Riboflavin Deficiency. B. K. Das Gupta.—p. 1389.
Further Studies in Amblyopia. J. B. Feldman.—p. 1394.
Clinical Evaluation of D.F.P. (Di-Isopropyl Fluorophosphate) in Glaucoma Therapy. M. B. Raiford.—p. 1399.

American Journal of Psychiatry, New York

106:241-320 (Oct.) 1949. Partial Index

Physiological Psychiatry. W. B. Terhune.—p. 241.
State Hospital Children's Unit. W. A. Oliver.—p. 265.
*America's Number One Problem—Chronic Disease and an Aging Population. H. A. Rusk.—p. 270.
Cerebral Morphologic Changes in Monkeys Subjected to Large Number of Electrically Induced Convulsions (32-100). A. Ferraro and L. Boizin.—p. 278.
How Specific is Psychotherapy? E. Zisking.—p. 285.
Neuropsychiatry in Group Practice. H. Stevens.—p. 292.
Relationship Between Highest Mental Capacity and Psychic Abnormalities. A. Juda.—p. 296.

Chronic Disease and an Aging Population.—Rusk shows that as the population of the United States ages the extent of physical disability increases. The Veterans Administration and some civilian hospitals have demonstrated that rehabilitation to the point of self care and even to full or limited employment is possible for many of the chronically ill. Hospital programs alone are not enough, it is necessary to have a broad community program and to provide rehabilitation and work therapy in the institutions for the aged. How a community can meet the needs of persons with senile psychosis has been demonstrated in Vancouver, B. C. In New York City, the problems of the aged person living alone in a boarding home or room have partially been solved by the development of a number of community centers.

American Practitioner, Philadelphia

4:1-58 (Sept.) 1949

Use of Large Doses of Progesterone in Rheumatoid Arthritis. N. E. Reich.—p. 1.
Frigidity. E. L. Williams.—p. 6.
Certain Pressor-Depressor Tests in Essential Hypertension: Comparison and Comment. T. Postelli and R. S. Palmer.—p. 9.
Recent Advances in Management of Diseases of Liver. E. Oppenheim.—p. 15.
Note on Ectopic Nipples. J. F. Embick, M. Dexter and W. B. Bean.—p. 23.
Indications for Splenectomy. L. R. Limarzi, LeR. H. Sloan, C. B. Puestow and W. H. Cole.—p. 25.
Isotopes in Biology and Medicine: Uses and Radiation Hazards. E. E. Painter.—p. 34.
Para-Esophageal Hernias. R. W. McNealy.—p. 39.
Asthma Due to Halogens. J. M. Sheldon and R. G. Lovell.—p. 43.
Pathology of Thyroid. G. Miles.—p. 45.

4:59-118 (Oct.) 1949

Management of Allergic Eczema. G. L. Waldbott.—p. 59.
*So-Called "Silent Myocardial Infarction." H. R. Hipp, J. M. Behrman and H. E. Heyer.—p. 64.
Clinical Physiology of Protein Deficiency: Protein Deficiency. W. S. Hoffman.—p. 67.
Clinical Observations on Hypotensive Effect of Certain Dihydrogenated Alkaloids of Ergot in Human Beings. I. L. Josepha.—p. 71.
*Chronic Sigmoid Volvulus. L. H. Boaber Jr. and E. L. Shelton Jr.—p. 75.
Is There a Specialized Muscular Conduction System in the Mammalian Heart? M. Lev.—p. 92.
Reinstatement of the Deafened in Their Kingdom of Hearing. F. L. Lederer.—p. 94.
Degenerative Arthritis. W. K. Ishmael.—p. 97.
Procaine Penicillin in Treatment of Subacute Bacterial Endocarditis. E. H. Roston and G. H. Stollerman.—p. 102.

Silent Myocardial Infarction.—Hipp and co-workers reviewed 150 cases of recent myocardial infarction, in 11 of which no history of pain was obtained. The diagnosis was confirmed by necropsy in 10 of the 11 cases. The condition in the eleventh case was confirmed by typical electrocardiographic recordings. Factors were present in each instance seemingly sufficient to mask the pain which usually occurs during such episodes. It is probable that the frequency with which a story of chest pain is elicited will vary with the ease with which the entire history is obtained. The possibility of a masked acute myocardial infarction should be kept in mind especially in patients in coma or with diabetic acidosis who are in the age group where myocardial infarction commonly occurs, even when the cause of the coma is known; in patients with congestive heart failure who, without adequate cause, display sudden onset or sudden exacerbation of symptoms; in postoperative patients, especially if known to have hypertension or arteriosclerosis, who are not responding well or have unexplained tachycardia or rise of temperature.

Chronic Sigmoid Volvulus.—Bosher and Shelton report 6 cases of intestinal obstruction due to volvulus of the sigmoid in 5 men and 1 woman between the ages of 52 and 77. The patients had a subacute or chronic type of obstruction with frequently recurring attacks. Failure to recognize the presence of a sigmoid volvulus in the absence of definite roentgen evidence of obstruction led to the performance of a cecostomy in the first case. The patient died subsequently from perforation. The ineffectiveness of cecostomy in achieving satisfactory decompression in the presence of sigmoid volvulus is stressed. Another patient demonstrated the tendency of sigmoid volvulus to recur after detorsion despite attempts at fixation of the sigmoid. Obstructive resection was employed in a third patient with gangrene and perforation, but the patient died of postoperative complications. Primary resection was carried out successfully in the 3 remaining cases. In the first instance resection was performed immediately after detorsion; in the second instance operative detorsion was employed as a preliminary stage to resection, and in a third instance conservative measures effected a partial reduction of the volvulus prior to resection. The literature on the subject indicates that nonoperative detorsion may be successfully accomplished in selected cases, even in the presence of complete obstruction. Simple roentgenograms of the abdomen and roentgenograms with barium enema facilitated the correct diagnosis. One or two greatly distended loops of sigmoid were usually shown in the right and central parts of the abdomen in the longitudinal position. Such a longitudinal loop tends to shift its position in the upright roentgenogram so as to incline upward and to the left. This sign has not been described previously. The "ace of spades" deformity, as demonstrated by barium enema, is a helpful diagnostic finding. The ability to force barium to the cecum does not eliminate the possibility of volvulus.

American Review of Tuberculosis, New York

60:149-272 (Aug.) 1949. Partial Index

Simple Tests of Ventilatory Function for Use in Sanatorium or Clinic. F. C. Warring Jr.—p. 149.
Phrenic Nerve Interruption in Treatment of Pulmonary Tuberculosis: Complications and Sequelae of Phrenicchasis. R. B. Mitchell.—p. 168.
Physical Therapy in Posthoracoplasty: One Year's Notes and Observations. J. Goldberg, R. Friedlander and others—p. 189.
Concerning the Location of Pulmonary Infarction. E. I. Zins.—p. 206.
Factors Affecting In Vitro Cytolysis of White Blood Cells by Tuberculin. C. B. Favour, P. Fremont-Smith and J. M. Miller.—p. 212.
Simplified Guinea Pig Test for Tuberculostatic Agents. F. I. Dessau, R. L. Yeager and M. Kulish.—p. 223.
Evaluation of Method of Obtaining Gastric Washings. J. B. Halloway Jr. and M. Cummings.—p. 228.
Pathologic and Experimental Studies of Boeck's Sarcoid: Report of Case with Panarteritis, Periarteritis, Terminal Hypertension and Uremia, and Reproduction of Sarcoid-Like Lesion in Guinea Pigs. S. R. Rosenthal.—p. 236.

Archives of Ophthalmology, Chicago

42:353-514 (Oct.) 1949

*Aneurysm of Posterior Communicating Artery. B. J. Alpers and N. S. Schlezinger.—p. 353.
Penetration of Aureomycin into Eye. A. deRoetth Jr.—p. 365.
Use of Tantalum for Ocular Drainage. M. W. Bick.—p. 373.
Corneal Transplantation in Cases of Aphakia and Ectopia of Lens: Selection of Cases; Technic of Operations Outlined; Report of New Instruments. C. I. Thomas.—p. 389.
Relation of Color Sensitivity in Visual Field to Laminar Pattern in Lateral Geniculate Body. L. W. Chacha.—p. 402.
Rheumatoid Involvement of Extraocular Muscles. J. V. Linman.—p. 410.
Influence of Iontophoresis on Permeability of Excised Cornea. C. Dyson.—p. 416.
*Trachoma in Missouri. A. A. Siniscal.—p. 422.
Conditioned Corneal Vascularity in Riboflavin Deficiency: Report of Case. H. J. Stern.—p. 438.
Personality Patterns in Ocular Discomfort. W. W. Wong.—p. 443.

Cerebral Aneurysm.—Alpers and Schlezinger report 7 cases of aneurysm of the posterior communicating artery in 6 women between the ages of 29 and 60 and in 1 man aged 59. Craniotomy was performed on 6 of the patients. Two died shortly after the operation, and 4 recovered. Because of the clear evidence of a ruptured aneurysm and subarachnoid hemorrhage in the seventh patient craniotomy was not undertaken, and the patient died after admission to the hospital. Aneurysm involving the posterior communicating artery was verified in this case by

autopsy. Aneurysms may involve the posterior communicating artery alone, without origin in the internal carotid artery. Recurrent headache associated with the development of ophthalmoplegia involving the third nerve appeared to be the most significant feature in the diagnosis.

Trachoma in Missouri.—According to Siniscal, trachoma is still one of the principal factors in the causation of blindness in the state of Missouri, although the incidence at present is on the decline. This is due to the work of the Trachoma Hospital in Rolla, Mo., which is supervised by the Missouri State Division of Health, to greater cooperation of patients both during hospitalization and subsequently and to earlier referral of patients by physicians and other agencies. The incidence of trachoma is not influenced by age, as the disease occurs at all ages. In Missouri, males are more frequently affected than females, the ratio being 2 to 1. The granular type of trachoma is becoming less frequent. The trachoma commonly seen is the papillary type, with the smooth, velvety, grayish or purplish conjunctiva, devoid of follicles. Pannus is diagnostic of trachoma, but in many cases there may be no evidence of pannus, although other cardinal signs may be apparent. In the absence of pannus trachoma can be confused with vernal conjunctivitis, inclusion blennorrhea or folliculosis. In such a case the diagnosis is difficult, and repeated observations may be necessary. The treatment of choice consists of instillation into the conjunctival sac at frequent intervals of highly soluble sulfonamide drugs. When a patient does not respond well to sulfonamide treatment, he may be given a course of silver nitrate, 0.0125 per cent solution instilled once daily in the morning, to be followed every two hours with zinc sulfate, 0.0125 per cent solution, throughout the day for one or two weeks; the sulfonamide routine is then reinstituted. Important in the management of trachoma is persistent and long-continued treatment for months or even a year. The control and eventual eradication of the disease will depend on the discovery of all persons with trachoma and on ophthalmologic examination of all contacts and associates of persons with recognized trachoma. A rise in the economic status and general educational standards in the affected population will decidedly improve trends toward eradication of the disease. Prevention through public health education is even more important than cure.

Bulletin of Johns Hopkins Hospital, Baltimore

88:253-326 (Oct.) 1949

Studies of Respiratory Air Flow: I. Significance of Normal Pneumotachogram. D. F. Proctor and J. B. Hardy.—p. 253.
Histochemical Studies on Cartilage and Bone: I. Normal Pattern. R. H. Follis Jr. and M. Berthrong.—p. 281.
*Acute Hepatitis in General Hospital Practice: Rôle of Transfusions and Inoculations. O. D. Ratnoff and G. S. Mirick.—p. 299.
Calometrographic Studies of Effects of Section of Parasympathetic Nerves of Colon. H. W. Scott Jr. and J. R. Cantrell.—p. 310.

Acute Hepatitis: Role of Transfusions and Inoculations.—Ratnoff and Mirick point out that transfusion of whole blood or plasma may be followed by what is usually called homologous serum jaundice. They reviewed the histories of all patients with hepatitis who were hospitalized at the Johns Hopkins Hospital between 1937 and 1948, inclusive. Patients with hemolytic or obstructive jaundice, amebic hepatitis, Weil's disease, hepatitis due to sulfonamides or cinchophen, or cirrhosis of the liver were eliminated from consideration. There remained 287 patients with acute infectious hepatitis, acute yellow atrophy of the liver, postarsphenamine hepatitis and homologous serum jaundice. Approximately 1 of every 7 patients hospitalized with acute hepatitis during a twelve year period had been given transfusions with homologous blood or a blood fraction five weeks to five months before the onset of the hepatitis. The fatality rate in 40 patients with homologous serum jaundice was 27.5 per cent. No clinical, laboratory or pathologic features other than difference in severity were observed which distinguished between homologous serum jaundice and other varieties of acute infectious hepatitis. Acute infectious hepatitis which occurred during pregnancy was frequently associated with abortion or premature delivery. Twenty per cent of 183 patients with hepatitis had had a parenteral test or injection of material other than blood or arsenic within five weeks to five months before the onset of their illness. Only 8 per cent of 258 control patients without hepatitis had had a similar test or injection. The probability that this difference could have occurred by chance is less than one in 100. The data emphasize the hazard of transmitting hepatitis by any procedure in which the skin is pierced, unless adequate sterilization of instruments has been achieved. All syringes, needles and lancets, whether used for withdrawal of blood or injection of any material, should be boiled or autoclaved before their use in each patient, in order to prevent the transmission of hepatitis.

California Medicine, San Francisco

71:253-318 (Oct.) 1949

Nutritional Aspects of Anastomotic Operations: with Special Reference to Sprue Syndrome. C. M. Jones.—p. 253.
*"Rooming-In" for Mothers and Infants: A Panel Discussion.
Obstetrician's Point of View. P. A. Reynolds.—p. 260.
Pediatrician's Point of View. R. G. Shirley.—p. 262.
Psychiatrist's Point of View. N. A. Levy.—p. 264.
Nursing Point of View. M. J. McGuirk.—p. 266.
Transurethral Prostatectomies: Review of 560 Cases. R. B. Mulhenix, R. J. Prestiss and R. E. Delaval.—p. 269.
Laryngospasm from the Anesthesiologist's Viewpoint. E. T. Hull Jr. —p. 271.
Endometriosis: Clinical and Pathological Study of 219 Cases. D. A. DeSanto and J. E. McBirnie.—p. 274.
Value of Blood Oxygen Determinations. H. R. Bierman.—p. 280.
Cardiospasm. G. Nagel.—p. 285.
Present Status of Abdominal Fascial Transplants. C. L. Lowman. —p. 287.
Carcinoma of Breast: Possible Significance of Menstrual Cycle in Results of Operation. F. R. Ruff.—p. 289.
Advances in Plastic Surgery. H. Conway.—p. 291.

"Rooming-In" for Mothers and Infants.—Reynolds states that the rooming together of mother and newborn infant during the lying-in period has been practiced on a limited scale in several obstetric centers for about two years. It is being considered as a desirable procedure by many other obstetric departments. The idea has seemed so practical and desirable and the popular demand has become so general that it seems timely and appropriate to discuss the many facets of the practice. The purpose of this panel discussion is to review the advantages and disadvantages and help make it possible to arrive at an intelligent evaluation of the procedure. The obstetrician, the pediatrician, the psychiatrist and the nurse, participants in this discussion, favored the rooming-in for mother and infant, since the advantages seemed to outweigh the disadvantages.

Diseases of Chest, Chicago

16:381-508 (Oct.) 1949

*Bronchiectasis and Its Management: Report of 277 Cases. C. R. Souders.—p. 381.
*Method for Topical Anesthesia by Nebulization of Local Anesthetics. J. B. Miller, F. Mann and H. A. Abramson.—p. 408.
*Diagnostic Bronchial Lavage in Tuberculosis. M. M. Bueno.—p. 420.
Recent Advances in Conservative Treatment of Giant Cavity. D. G. Alarcon.—p. 431.
Surgery in Congenital Heart Disease. R. Adams.—p. 442.
Modern Evaluation of Extrapleural Pneumonolysis in Treatment of Pulmonary Tuberculosis, with Special Reference to Methyl Methacrylate "Plombage": Review of 26 Cases. H. E. Walkup and J. D. Murphy.—p. 456.
Systemic Blastomycosis. D. D. Feld and A. V. Cadden.—p. 473.
Arthralgia as First Symptom of Pulmonary Lesions. R. Berg Jr. —p. 483.
Unusual Case of Traumatic Diaphragmatic Hernia with Successful Operation. D. M. Caldwell and F. G. Preston.—p. 488.
Cholesterol Pleural Effusion. H. A. Lyons.—p. 495.

Bronchiectasis.—Souders reports on 277 patients, 135 men and 142 women between the ages of 4 and 80 years, with bronchiectasis. Children were in the minority, and there was a surprisingly large number of patients (70) between the ages of 50 and 60 years. The five major symptoms of the disease are cough, sputum, hemoptysis, dyspnea and chest pain. Forty-five patients presented all these symptoms. Cough was the most frequent complaint. Thirty-three patients had hemoptysis. Pneumonia was present at some time in 159 patients. Plain roentgenograms were abnormal in 251 patients, but there were also 26 patients who showed no evidence of disease in the roentgenogram even after the diagnosis had been proved and the

roentgenograms were reviewed. A great variety of microorganisms occurred in the 93 cultured sputums. Penicillin or streptomycin had a pronounced effect in altering the amount and the character of the sputum. Surgical extirpation of the diseased area is the only method of cure. Seventy-eight patients have had 95 operations, with removal of 126 lobes or segments of lobes. Twenty-five of the 121 patients with bilateral disease were subjected to surgical resection, and 6 of the 25 had lobectomy or bilobectomy performed on both sides. Surgery on the worse side allowed so much improvement in the other 19 bilateral cases that the second operation was deemed unnecessary. Sinusitis was present in 93 patients. Thirty-five of these were subjected to radical sinus operation. Medical measures of treatment were used along with surgical procedures. Considerable improvement took place at times by correction of hours of rest and dietary habits and by avoidance of fatigue, respiratory infections and excessive use of tobacco or alcohol. Penicillin was given both intramuscularly and by inhalation to hospitalized patients and by inhalation or by mouth to ambulatory patients. Streptomycin is best given by intramuscular injection combined, if desired, with inhalation of nebulized solutions to patients who do not respond to penicillin. Results of the methods of treatment were classified in 194 patients followed one month to twelve years. The most favorable outcome was obtained in those handled surgically, although some improvement occurred in most patients. Unless it is possible to obtain a radical cure by surgical treatment, bronchiectasis must be managed by a complete program carefully followed by the patient in full cooperation with his physician.

Topical Anesthesia by Nebulization.—Miller and coworkers employed topical anesthetic solutions by nebulization. The solution consisted of 0.5 per cent of tetracaine hydrochloride and 4 per cent cocaine, with 1 minim of 1:1,000 epinephrine for each cubic centimeter of solution to delay absorption. A nebulizer was inserted into the patient's mouth in such a way that the delivery end of the rubber mouth piece was well back in the mouth. The entire technic requires about five minutes of the anesthetist's time, who is free to do other work in the remaining 25 minutes while the patient administers his own anesthetic under supervision. The procedures performed with this technic include bronchography, bronchoscopy, bronchospirometry and endotracheal intubation. The success of nebulization anesthesia is based on the particle size of the aerosol produced by the nebulizer. This method is almost entirely free from the disadvantages and dangers of the conventional methods and is accompanied with little or no discomfort to the patient.

Bronchial Lavage in Tuberculosis.—According to Bueno, bronchial lavage gave positive results in 15 of 39 cases at Sassaquin Sanatorium, Massachusetts, and in 12 of the 15 cases the lesions were located in only one or both upper lobes. Not a single accident has been reported in 200 bronchial lavages performed in the United States. Bronchial lavage is the test of choice in mass x-ray surveys when minimal lesions are found. Bronchial lavage requires close cooperation of the patients and should, therefore, be withheld from children less than 12 years of age. It is contraindicated in patients with severe impairment of pulmonary function, hemoptysis, cardiac decompensation and bronchial asthma. Bronchial lavage has several advantages over gastric lavage: its technic is easier for the physician; it is better tolerated by the patient; it can be performed at any time, and the acid-fast bacilli are not destroyed as they are by the gastric juice when stomach washings are not properly treated.

Endocrinology, Springfield, Ill.

45:211-350 (Sept.) 1949. Partial Index

Effect of Growth Hormone upon Liver and Kidney D-Amino Acid Oxidase and upon Muscle Succinic Acid Dehydrogenase. O. H. Gaebler, J. C. Mathies and L. Palm.—p. 267.

Paradoxical Effects of Thiocyanate and of Thyrotropin on Organic Binding of Iodine by Thyroid in Presence of Large Amounts of Iodide. M. S. Raben.—p. 296.

Studies on Fat-Mobilizing Factor of Anterior Pituitary Gland. R. W. Payne.—p. 305.

Cytotoxic Action of Hormones of Adrenal Cortex According to Method of Unstained Cell Counts. R. Schrek.—p. 317.

Adrenotrophic Activity of Human Blood. A. B. Taylor, A. Albert and R. G. Sprague.—p. 335.

Hawaii Medical Journal, Honolulu

9:1-68 (Sept.-Oct.) 1949

Changing Indications for Therapeutic Abortion in Pulmonary Tuberculosis. H. E. Bowles and C. A. Domzalski Jr.—p. 17.

Coronary Thrombosis in Territory of Hawaii. H. C. Gotshalk and J. Bell.—p. 24.

Recent Advances in Psychiatry. M. Guensberg.—p. 27.

Secondary Repair of Harelip. W. W. Wong.—p. 32.

Indiana State Medical Assn. Journal, Indianapolis

42:1043-1118 (Oct.) 1949

Toe Pedicles in Reconstruction of Forefoot. J. A. McClintock.—p. 1061.

Present-Day Concept of Adrenal Cortical Physiology with Reference to Treatment of Addison's Disease by Glandular Transplant. D. E. Wood.—p. 1064.

Isolated Paralysis of Serratus Anterior Muscle: Case Report. J. P. Griffin.—p. 1068.

Tinea Capitis: Review of Problem. J. C. Slaughter, J. E. Dalton, R. E. Jenkins and B. H. Booth.—p. 1070.

Chylous Ascites: Case Report. J. F. Ferrara Jr. and R. Walker II. —p. 1073.

Journal of Clinical Investigation, Cincinnati

28:1057-1246 (Sept. [Part II]) 1949. Partial Index

Serum Proteins in Infectious Mononucleosis. Electrophoretic Studies. K. Sterling.—p. 1057.

Evidence that Renal Sodium Excretion by Normal Human Subjects is Regulated by Adrenal Cortical Activity. A. Leaf and W. T. Couter.—p. 1067.

Further Studies with Salt Tolerance Test in Normal Individuals and in Patients with Adrenal Cortical Hyperfunction. L. J. Soffer, J. L. Gabrilove and M. D. Jacobs.—p. 1091.

Action of Streptococcal Desoxyribose Nuclease (Streptodornase), In Vitro and on Purulent Pleural Exudations of Patients. S. Sherry, A. Johnson and W. S. Tillett.—p. 1094.

Studies with Radioactive Iodized Fat. I. Preparation of Radioactive Fat with Observations on Absorption of Fat Following Subcutaneous and Intraperitoneal Injection in Dogs. A. M. Rutenburg, A. M. Seligman and J. Fine.—p. 1105.

Measurement of Extracellular Fluid in Man by Means of Constant Infusion Technique. I. L. Schwartz, D. Schachter and N. Freinkel. —p. 1117.

Studies of Role of Liver in Human Carbohydrate Metabolism by Venous Catheter Technic. II. Patients with Diabetic Ketosis, Before and After Administration of Insulin. P. K. Bondy, W. L. Bloom, V. S. Whitner and B. W. Farrar.—p. 1126.

Studies of Pulmonary Circulation. I. Circulation Time from Pulmonary Artery to Femoral Artery and Quantity of Blood in Lungs in Normal Individuals. R. V. Ebert, C. W. Borden, H. S. Wells and R. H. Wilson.—p. 1134.

Maturation of Renal Function in Childhood: Clearance Studies. M. I. Rubin, E. Bruck and M. Rapoport.—p. 1144.

Cerebral Blood Flow in Male Subjects as Measured by Nitrous Oxide Technique. Normal Values for Blood Flow, Oxygen Utilization, Glucose Utilization and Peripheral Resistance, with Observations on Effect of Tilting and Anxiety. P. Scheinberg and E. A. Stead Jr.—p. 1163.

Serological Studies in Rheumatic Fever. II. Serum Complement in Rheumatic State. E. E. Fischel, R. H. Pauli and J. Losh. —p. 1172.

Evaluation of Therapeutic Substances Employed for Relief of Bronchospasm. V. Adrenergic Agents. E. Bresnick, J. F. Beakey, L. Levinson and M. S. Segal.—p. 1182.

Chloramphenicol (Chloromycetin) in Treatment of Tsutsugamushi Disease (Scrub Typhus). J. E. Smadel, T. E. Woodward, H. L. Ley Jr., and R. Lewthwaite.—p. 1196.

Changes in Liver Glycogen Studied by Needle Aspiration Technic in Patients with Diabetic Ketosis. With a Method for Estimation of Glycogen from Histologic Preparations. P. K. Bondy, W. H. Sheldon and L. D. Evans.—p. 1216.

Comparisons of Distribution of Radioactive Iodine in Serum and Urine in Different Levels of Thyroid Function. R. H. Williams, H. Jaffe and B. Bernstein.—p. 1222.

Effects of Adrenocorticotrophic Hormone on Neuro-Muscular Function in Patients with Myasthenia Gravis. C. Torda and H. G. Wolff. —p. 1238.

Serum Proteins in Portal Cirrhosis Under Medical Management. Electrophoretic Studies. K. Sterling, W. E. Ricketts, J. B. Kirsner and W. L. Palmer.—p. 1236.

Pituitary Adrenal Corticotropic Hormone in Myasthenia Gravis.—Torda and Wolff administered pituitary adrenal corticotropic hormone to patients with myasthenia gravis on the basis of the following considerations: (1) the immediate cause of the symptoms of myasthenia gravis is a decrease of acetylcholine synthesis; (2) administration of pituitary adrenal corticotropic hormone increases acetylcholine synthesis in vivo; (3) increase of the lymphatic tissue and "hyperfunctioning" thymus have been found in patients with myasthenia gravis; (4) removal of the pituitary gland in rats induces changes in the electromyogram that closely resemble

V 1
195

the abnormalities noted in patients with myasthenia gravis, and (5) the pituitary gland of several patients who died of myasthenia gravis showed accumulation of an eosinophilic colloid material suggesting altered function of the gland. Pituitary adrenal corticotropic hormone was administered to 5 patients moderately to severely ill with myasthenia gravis. Prior to administration of the hormone the patients exhibited the known decline of the amplitude of muscle action potential during repetitive indirect stimulation. Also, the amount of work performance on an ergograph averaged only 30 per cent of that performed by healthy subjects selected from the same sex and from similar age groups. The amount of acetylcholine synthesized in the presence of blood serum of the patients was below normal. Four hundred milligrams of pituitary adrenal corticotropic hormone were administered in 30 mg. amounts every six hours. The patients experienced an increase in disability during the period of administration. The second day after completion of the series of injections the patients experienced changes suggesting the beginning of an incomplete remission of the disorder. This consisted of improvement in the muscle function during the administration of appreciably reduced neostigmine bromide dosage. The much reduced ability of blood serum to support acetylcholine synthesis returned to normal. The electromyogram and myogram became similar to those of healthy subjects. This incomplete remission produced by pituitary adrenal corticotropic hormone persisted for an, as yet, undefined period.

Journal of Investigative Dermatology, Baltimore

13:157-220 (Oct.) 1949

Basic Research in Dermatology. S. Rothman.—p. 165.
X-Ray Diffraction Studies in Calcinosis. T. Cornbleet, C. I. Reed and B. P. Reed.—p. 171.
Lewandowsky's Rosacea-Like Eruption: Clinical Study. R. H. Snapp. —p. 175.
Seronegative Secondary Syphilis. I. W. Kuhl and G. C. Sauer.—p. 191.
Experimental Approach to Psychocutaneous Problems. F. F. D. Seitz. —p. 199.

Journal of Lab. and Clinical Medicine, St. Louis

34:1175-1320 (Sept.) 1949. Partial Index

Studies of Differences Between Biuret and Kjeldahl Determinations of Serum Proteins. G. R. Kingsley and L. A. Terzian.—p. 1175.
*Heberden's Nodes: Relationship of Menopause to Degenerative Joint Disease of Fingers. R. M. Stecher, E. E. Beart and A. H. Hersh. —p. 1193.
State of Component A (Prothrombin) in Human Blood; Evidence That It Is Partly Free and Partly in Inactive or Precursor Form. A. J. Quick and M. Stefanini.—p. 1203.
Failure of Sensitized Sheep Cell Agglutination to Clarify Diagnosis of Rheumatic Disease. J. E. Miller, E. R. Lynch and J. Lansbury.—p. 1216.
Evaluation of In Vitro Heparin Tolerance Test for Thromboembolic Disease. D. I. Kravebick and L. Sheiman.—p. 1222.
Observations on Coagulation Defect in Thrombocytopenic Purpura. T. L. Carr and W. M. Fowler.—p. 1227.
Serum Glutamic Acid Levels and Occurrence of Nausea and Vomiting After Intravenous Administration of Amino Acid Mixtures. S. Levey, J. E. Harroun and C. J. Smyth.—p. 1238.
Carbonic Anhydrase Activity in Sickle Cell Anemia, Sickle Cell Trait, and Pernicious Anemia. R. G. Schneider, W. C. Levin and M. E. Haggard.—p. 1249.
Clinical Studies on Thiomerin, a New Mercurial Diuretic. I. W. Wolk and R. B. Benedict.—p. 1254.
Limitations and Merits of Single Serum Sample Analysis in Differential Diagnosis of Jaundice. F. W. Hoffbauer, E. D. Ramos and J. K. Meinert.—p. 1259.
Effect of Epinephrine on Vitamin A and Glucose Blood Levels in Normal and Cirrhotic Subjects. R. W. Hillman.—p. 1279.
Intestinal Parasitism in American Troops in Germany: Relation to Transmission of Viral Hepatitis. P. L. Burlingame and H. T. Gardner.—p. 1284.
Primary Histoplasmosis with Recovery of Histoplasma Capsulatum from Blood and Bronchial Secretions. R. H. Kunstadter, F. C. Whitcomb and A. Milzer.—p. 1290.

Heberden's Nodes: Menopause and Degenerative Joint Disease of Fingers.—Stecher and his associates define Heberden's nodes as enlargements of terminal interphalangeal joints of the fingers due to degenerative joint disease. Individual fingers are at times affected, especially in men, as a result of injury which produces a true traumatic arthritis. The deformities affecting multiple fingers on both hands arise spontaneously without history of injury. The present study is confined to the latter type, the idiopathic Heberden's nodes. Women are affected much more commonly than men. Since these nodes are rare before the age of 50, their occurrence is thought to be related to the climacteric. The authors compared the age of onset of Heberden's nodes with that of menopause in 99 women. Both events occurred within one year of each other in 10 instances and within three years of each other in half the cases. The appearance of Heberden's nodes in individual patients occurred from twenty years before to fifteen years after the menopause. The coefficient to correlation was found to be +0.46, indicating odds less than 1 to 1,000,000 that this degree of correlation would occur by chance alone. Even this high degree of correlation does not indicate that the climacteric has a causal relation to Heberden's nodes. It is more likely that both events have causative factors in common. The principal effect of the climacteric on the production of Heberden's nodes may be due to alterations in the peripheral circulation.

Journal of Nervous and Mental Disease, New York

110:185-276 (Sept.) 1949

Nonconvulsive Biochemotherapy with Histamine and Electric Convulsive Therapy; Comparative Study on Hospitalized Psychotics with Control ECT Series. A. M. Sackler, M. D. Sackler and R. R. Sackler.—p. 185.
Orienting Concepts in Study of Affective States: Part I. A. Gemelli. —p. 198.
Psychopathology of Impulsive Wandering. F. Pollak.—p. 215.
Experimental Catatonia and Problem of Will and Personality. H. Baruk. —p. 218.
Phenomena of Depersonalization. J. L. Saperstein.—p. 236.

110:277-368 (Oct.) 1949

Massive Spontaneous Hemorrhage in Gliomas (Report of 7 Verified Cases). L. O. J. Manganiello.—p. 277.
Orienting Concepts in Study of Affective States. Part II. A. Gemelli. —p. 299.
Introductor Outline of Short Method of Psychotherapy. L. A. Gottschalk.—p. 315.
Diagnostic Problems in Early Schizophrenia. N. C. Mace, S. A. Kofl, I. Cheloek and S. L. Garfield.—p. 336.
Cerebral Concussion: Psychosomatic Survey. A. M. Meerloo.—p. 347.

Journal of Urology, Baltimore

62:403-638 (Oct.) 1949. Partial Index

Etiology and Management of Renal Lithiasis. C. C. Higgins.—p. 403.
Primary Renal Actinomycosis. E. Baron and L. J. Arduino.—p. 410.
*Atrophic Kidney and Hypertension. J. R. Kilman, E. O. Bradfield and C. M. Simpson.—p. 417.
*Unilateral Malignant Nephrosclerosis. N. H. Schwartz and S. Groun. —p. 426.
Voluntary Fluid Intake After Nephrectomy. I. Mack and S. Reddard.—p. 446.
Papillary Epitheliomas in Each Ureter and in the Bladder. D. O. Ferris, J. H. Kaplan and G. J. Thompson.—p. 448.
New Method of Ureterosigmoidostomy. W. F. Melick.—p. 454.
Recurrent Traumatic Intraperitoneal Rupture of the Bladder. B. E. Cohler and E. A. Seidman.—p. 463.
Endometriosis of the Bladder. W. L. Fitzgerald and M. A. R. Kuhn.—p. 467.
Some Observations on the Technique of Transurethral Prostatic Resection. J. B. Wear.—p. 470.
Prostatic Infarction. R. B. Roth.—p. 474.
Lymphosarcoma of the Prostate. J. I. Waller and W. A. Shullenberger.—p. 480.
Elevation of Serum Acid Phosphatase Following Prostatic Massage. E. Hock and R. N. Tessier.—p. 488.
Urethral Diverticulum in the Female. E. N. Cook and T. L. Pool. —p. 495.
Chronic Trichomonas Skeneitis. L. W. Riba.—p. 503.
Primary Carcinoma of the Male Urethra: Report of Two Cases. H. A. Gailey and J. W. Best.—p. 507.
Congenital Epispadias with Incontinence. J. E. Dees.—p. 513.
Traumatic Avulsion of the Skin of Penis and Scrotum. D. O. Ferris.—p. 523.

Atrophic Kidney and Hypertension.—Kilman and coworkers subjected 12 women and 1 man with unilateral atrophic pyelonephritis to a nephrectomy for the relief of hypertension. The blood pressure returned to normal and had remained normal for two to nine and one-half years in 7 of the 13 patients. The blood pressure remained the same in 5 patients, 3 of whom died within six months, nine months and four years, respectively, following the nephrectomy. The blood pressure remained the same after eighteen months in 1 patient, though the symptoms were definitely relieved. The average duration of known hypertension was three years, the shortest duration less than one year and the longest approximately eight years. The group with good results showed an average duration of hypertension of two years; that with poor results, an average duration of three years. In 6 of the 7 patients with good results the

opposite kidney was considered hypertrophied, but this was not noted in any of the patients with poor results. The function of the atrophic kidney was normal in 1 of the 7 patients whose blood pressure was restored to normal. It was poor in 4, and the atrophic kidney was not functioning in the remaining 2 patients. The function was definitely reduced in the atrophic kidney of all patients having poor results. An atrophic kidney can be a factor in producing hypertension, and nephrectomy will give relief in some instances. Criteria regarding nephrectomy for hypertension are: (1) The kidney should show a definitely reduced function, and (2) the normal kidney should show some evidence of hypertrophy, indicating that it is compensating for loss of function of the diseased kidney. Best results can be expected in patients below 45 years of age. The duration of the elevation of blood pressure also has some bearing on the results to be expected.

Unilateral Malignant Nephrosclerosis.—Schwartz and Gross report 1 case of unilateral malignant nephrosclerosis resulting from interference with the blood supply of the contralateral renal artery in a man aged 41. For nine years the patient had experienced severe intermittent pain in the left foot and thigh accentuated by walking. Thromboangiitis obliterans was diagnosed on the basis of clinical signs. Death resulted from bilateral pneumonia. Necropsy revealed extensive atherosclerosis in the lower thoracic and abdominal aorta with thrombi deposited on the atheromatous plaques. A similar process involved the mouth of the left renal artery. The obstruction to the blood flow in this renal artery was of some standing. The changes in the plaque and overlying thrombus indicated that they may well have antedated the onset of hypertension. In the latter stages of the patient's illness a fresh thrombus was superimposed on the old one, aggravating the obstruction. The initial insult in this vessel presumably led to "altered renal hemodynamics," which was the initiating impulse in the development of the patient's hypertension. Later the circulation in this narrowed vessel was not sufficient for the metabolic needs of this organ, and focal areas of atrophy supervened. The right kidney presented an entirely different picture in which the thickened and sclerotic arteries and arterioles, many of the latter exhibiting arterial fibroid necrosis, were predominant. Widespread glomerular and tubular change added to the picture of severe renal damage. The clinical diagnosis of thromboangiitis obliterans of the lower extremities was borne out by the postmortem study. Involvement of the smaller pulmonary arteries by organized and recanalized thrombi obviously antedated the organizing pneumonia. Malignant hypertension occurring in the presence of a diffuse vascular disease should suggest the clinical diagnosis of thrombosis of the renal artery.

Kentucky Medical Journal, Bowling Green

47:339-388 (Sept.) 1949

Recent Advances in Tuberculosis. R. Comstock.—p. 369.
Recent Advances in Surgery. J. D. Hancock.—p. 372.
Recent Advances in Medicine. T. V. Gudex.—p. 374.
Retropubic Prostatectomy. N. L. Bosworth.—p. 378.
Recent Advances in Pediatrics. H. S. Andrews.—p. 380.
Confirm Cancer. J. Love.—p. 382.

47:389-424 (Oct.) 1949

Renal Physiology and Hypertension. A. S. Warren.—p. 394.
One Stage Trans-Thoracic Operation for Carcinoma of Lower Esophagus and Cardiac End of Stomach. L. E. Hurt.—p. 403.
Clinical Gastroscopy. C. C. Johnston.—p. 405.
Adie's Syndrome—The Myotonic Pupil. E. Roseman.—p. 410.
Hyaluronidase. R. G. Elliott.—p. 413.
Trends in Treatment of Syphilis. R. F. Hansen.—p. 414.

Military Surgeon, Washington, D. C.

105:273-356 (Oct.) 1949

Medical Service Corps of the U. S. Navy. C. L. Andrus.—p. 273.
Medical Service Corps of the U. S. Naval Reserve. M. Brooks.—p. 275.
Cysts of Semilunar Cartilages of Knee Joint. E. A. Brav.—p. 278.
End Results of Treatment of Compound Fractures of Tibia. W. G. Stuck and K. Dunlap.—p. 282.
Reiter's Disease with Keratosis Blennorrhagica. U. L. Throm.—p. 287.
Rupture of Quadriceps Tendon. A. A. Michele and F. J. Krueger. —p. 292.
Stevens-Johnson Syndrome—with Case Report. R. D. Wright.—p. 294.
Pathologic Physiology of Truck and Car Driving. H. D. Clayberg. —p. 299.
Surgeons in Battle: Mobile Surgical Hospital in Burma 1943 to 1945. J. H. Stone.—p. 311.

Minnesota Medicine, St. Paul

32:865-952 (Sept.) 1949

Recent Advances in Pernicious Anemia, Hypochromic Anemias and Hemolytic Anemias. J. J. Boehrer.—p. 889.
Leukemia, Lymphoblastoma and Polycythemia Vera. L. R. Limarzi. —p. 892.
Anesthesia for Thoracic Procedures. J. W. Baird.—p. 896.
Management of Diseases of Thorax: Surgical Aspects. G. E. Lindskog —p. 898.
Postoperative Management Following Surgery of Malignancies of Large Bowel. H. E. Bacon and L. F. Sherman.—p. 903.
Employment of Rectus Sheath and Superior Pubic Ligament in Direct Inguinal Hernia. H. Mattson.—p. 909.
Studies in Experimental Gastric Carcinogenesis. C. R. Hitchcock.—p. 910.

32:953-1056 (Oct.) 1949

Approach to Distinction of Medical and Surgical Jaundice. C. J. Watson.—p. 973.
Melorheostosis: Case with Monomelic Distribution. G. S. Boyer and H. M. Berg.—p. 979.
Multiple Myeloma: Review of 95 Proven Cases with 75 Autopsies. R. B. Breitenbucher and A. J. Hertzog.—p. 986.
*Sarcoidosis: Clinical and Laboratory Study of 17 Cases. M. H. Kulwin, W. H. Feldman, H. C. Hinshaw and H. Montgomery. —p. 989.
Modern Concepts of Treatment in Disorders of Lacrimal Apparatus. R. O. Rychener.—p. 991.
Treatment of Carpal Navicular Injuries. C. G. Caspers.—p. 992.
Surgical Management of Intestinal Obstruction. M. G. Gillespie, A. J. Schleper, J. W. Halverson and G. W. Heine Jr.—p. 995.
Insured for Health. P. T. Watson.—p. 1001.
Hemopericardium Without Rupture of Heart Following Dicumarol Therapy for Myocardial Infarction. J. F. Hammarsten.—p. 1003.
Thyroid Adenomata in Children: Review of Literature and Report of Case in Nine-Year-Old Boy. L. M. Larson and J. H. Rosenow. —p. 1005.

Clinical and Laboratory Aspects of Sarcoidosis.—Kulwin and his associates report clinical and laboratory findings in 17 patients seen at the Mayo Clinic in whom a diagnosis of sarcoidosis was made and in whom animal inoculation and cultural studies were performed on specimens of tissue. The aim was to perform thorough bacteriologic studies on tissue in order to investigate the possible relation of tuberculosis to this entity. The clinical diagnosis in each case has been substantiated by histopathologic study of either a section of skin or a lymph node. Laboratory studies, including cultures and the inoculations of animals to determine the presence of Mycobacterium tuberculosis, were done on tissue specimens in each case. Material from all 17 cases gave negative results.

New Orleans Medical and Surgical Journal

102:159-202 (Oct.) 1949

Pharmacology of Anticoagulant Agents. R. G. Smith.—p. 159.
Treatment and Prevention of Pulmonary Embolism, Venous Thrombosis and Other Thrombo-Embolic Episodes. G. M. Anderson.—p. 162.

SYMPOSIUM ON RICKETTSIAL DISEASES

Clinical Aspects of Rikettsialpox, Q. Fever and Rocky Mountain Spotted Fever. L. Thomas.—p. 166.
Laboratory Diagnosis of Rickettsial Disease. G. J. Buddingh.—p. 170.
Pathology of Rickettsial Diseases in Man. J. Zinkind.—p. 172.
Epidemiologic and Public Health Aspects of Typhus and Rocky Mountain Spotted Fevers. R. L. Simmons.—p. 175.
Winter Asthma. H. D. Ogden.—p. 179.
Treatment of Congenital Glaucoma with Beta Radiation: Report of Case. G. M. Haik, L. A. Breffeilh and J. E. Boggess.—p. 182.
Acute Pulmonary Tuberculosis: Report of Case Successfully Treated by Lobectomy and Dihydrostreptomycin. J. P. Myers.—p. 185.
Brucellosis with Jaundice: Report of Case. L. A. Monte and J. E. Garcia.—p. 187.
*Treatment of Inflammatory Dermatoses with Oral Bismuth (Sodium Bismuth Triglycollamate). J. K. Howles.—p. 190.

Oral Bismuth Therapy in Inflammatory Dermatoses.—The clinical material presented by Howles was obtained from the Dermatology Clinics of Charity Hospital in New Orleans and from the private practice of the author and his associates. Sodium bismuth triglycollamate is 1 mole of a bismuthyl salt of triglycollamic acid combined with 3 moles of disodium triglycollamate to form a double saltlike structure. The original clinical investigation with this drug was conducted to determine the value of the oral form of bismuth in the treatment of all stages of syphilis. In the course of the investigation, certain nonspecific, inflammatory dermatoses were accidentally included in the scope of the investigative work to determine the response of these dermatoses to sodium bismuth triglycollamate. The cases in which this drug was used included 69 of verruca, 69 of lupus erythematosus, 56 of vitiligo, 39 of lichen planus, 11 of sarcoi-

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195

dosis, 9 each of granuloma annulare and plantar warts, 6 of morphea and 5 of scleroderma. On the basis of the results obtained in these cases the author concludes that sodium bismuth triglycollamate has great value in treating certain inflammatory dermatoses and in some dermatoses not accompanied with an inflammatory reaction, when given in dosages of 3 to 6 tablets daily, preferably after meals. Each tablet contained the equivalent of 75 mg. of metallic bismuth. The drug seems to be an excellent adjunct to the dermatologic armamentarium, particularly when used as an auxiliary or supplementary measure. The relatively low toxicity of the drug, the excellent tolerance to it, the ease of administration, the infrequency of even mild complications and the proved balance of the rate of absorption and excretion seem to justify its use in the types of dermatoses mentioned in this survey.

New York State Journal of Medicine, New York

49:2223-2350 (Oct. 1) 1949

SYMPOSIUM ON PSYCHOSURGERY

Successes and Failures Following Frontal Lobotomy. B. E. Moore, B. Simon, S. Friedman and C. O. Ranger.—p. 2263.
Thalamotomy: Neuropsychiatric Aspects. E. A. Spiegel, H. T. Wycis and H. Freed.—p. 2273.
Thalamotomy and Mesencephalothalamotomy: Neurosurgical Aspects (Including Treatment of Pain). H. T. Wycis and E. A. Spiegel.—p. 2275.
Results of Topectomy in Treatment of Psychiatric Conditions. J. J. Weber, R. G. Heath and J. L. Pool.—p. 2278.
Comparison Between Various Forms of Psychosurgery. F. A. Mettler.—p. 2283.
Placental Stage and Postpartum Hemorrhage. W. J. Dieckmann, A. G. Seski, C. P. McCartney and R. C. Smittler.—p. 2287.
Extraperitoneal Cesarean Section: Is There Still a Need for It? W. F. Nelms.—p. 2295.
Present Status of Rh Counterimmunization. C. A. Gwynn.—p. 2299.
Vaginal Smear Examination as Diagnostic Aid in Gynecology. L. L. Mackenzie.—p. 2303.
Spontaneous Rupture of Granulosa Cell Tumors of Ovary with Massive Intra-Abdominal Hemorrhage. W. G. French.—p. 2305.
Meckel's Diverticulum: Twenty-Year Survey and Report of Unusual Case. R. M. Hyman and S. L. Gumport.—p. 2309.
Sigmoidorectal Electrosurgical Snare. R. Turell.—p. 2311.
Antihistaminic Therapy of Allergic Disorders in Infants and Children. I. N. Kugelmass.—p. 2313.

North Carolina Medical Journal, Winston-Salem

10:469-528 (Sept.) 1949

Recent Advances in Treatment of Neurosyphilis. A. S. Rose.—p. 469.
Differential Diagnosis of Jaundice. A. Freedman.—p. 473.
Evaluation of Thephorin as Adjunct in Treatment of Pruritic Dermatoses. A. H. Flower Jr.—p. 476.
Gas Gangrene: Review of Subject and Report of 2 Cases Successfully Treated by Extensive Debridement. W. B. McCutcheon, R. D. Baxley and J. C. Foushee.—p. 479.
Carcinoma of Breast with Analysis of 134 Cases. W. R. Deaton Jr., R. W. Postlethwait and H. H. Bradshaw.—p. 484.
Combat Guilt Reactions. R. L. Garrard.—p. 488.
Use of Darvisal in Acute Poliomyelitis. R. Grayson.—p. 492.
Sir William Osler: VII. Some Details of His Early Life as Collected by a Near Relation. N. B. Guyn.—p. 494.

Oklahoma State Medical Assn. Jour., Oklahoma City

42:423-464 (Oct.) 1949

Newer Concepts of Epilepsy. R. A. Hayne and T. R. Turner.—p. 426.
Intra-Ventricular Brain Tumors. L. M. Pascucci.—p. 428.
Treatment of Herpes Zoster. W. H. Doyle.—p. 429.
Electroencephalogram in Severe Head Injuries with Tantalum Cranioplasty. M. S. Ungerman.—p. 433.
*Effects of Certain Steroid Compounds on Various Manifestations of Rheumatoid Arthritis: Preliminary Report. W. K. Ishmael, A. Hellbaum, J. F. Kuba and M. Duffy.—p. 434.
Simplified Method of Diagnosing Peptic Ulceration and Determining Activity. T. Byaum and G. Winn.—p. 438.

Steroid Compounds in Rheumatoid Arthritis.—Ishmael and his co-workers treated 90 patients with rheumatoid arthritis with testosterone propionate, estradiol benzoate and pregneninolone. In addition, 6 patients with the shoulder-hand syndrome, 4 patients with chronic tophaceous gout and 2 with rheumatic fever were given similar therapy. The dose level and balance of the substances used had to be determined individually. Between 100 and 300 mg. of testosterone propionate in oil, in a solution of 50 mg. per cubic centimeter, were given intramuscularly. The dose was varied according to sex and weight. Pronounced improvement resulted within twenty-four hours, lasting approximately two days. After the minimal dose was determined, treatment with estradiol benzoate was started, initially about 0.033 mg., together with the androgenic compound. This dose was increased to the maximal amount of the estrus-producing compound tolerated. The androgenic and estrogenic steroids were given in the selected combination at intervals indicated by the time of persistence of the effects of the first injection, for approximately three weeks. Pregneninolone was then added—usually 100 mg. initially. The authors then reduced the androgenic and estrus-producing compounds as much as possible, keeping their relative proportion, the object being to avoid undesirable virilizing effects. Eighty-one of the 90 patients who received one or more of these steroids for periods ranging from four to twelve weeks had remissions, with improvement in pain, edema, weight, appetite, mental outlook, mobility, red blood cell count and sedimentation rate. Variants when present, such as the conjunctivitis and urethritis associated with Reiter's disease, erythema nodosum, psoriasis and iritis, were favorably affected. Four of the group made no response at all, and 5 continued to respond erratically or had irregular periods of incomplete remissions and exacerbations. The additional 12 patients with the shoulder-hand syndrome, tophaceous gouty arthritis and rheumatic fever were also favorably influenced by the steroids.

Pediatrics, Springfield, Ill.

4:391-568 (Oct.) 1949. Partial Index

Angiocardiographic Studies on Human Foetal Circulation: Preliminary Report. J. Lind and C. Wegelius.—p. 391.
Minute Absorption of Diphtheritic Antibodies from Gastrointestinal Tract in Infants. B. Vahlquist and C. Högstedt.—p. 401.
*Rickets in Newborn Infants: Clinical and Histologic Study. S. Ranström and G. von Sydow.—p. 406.
Mixed Infection of Hemolytic Streptococci in Cases of Primary Tuberculosis in Children. S.-I. Rollof.—p. 412.
Thumbsucking: Frequency and Etiology. G. Klackenberg.—p. 418.
Congenital Toxoplasmosis: Clinical, Histopathologic and Parasitologic Observations During Life and at Post Mortem. S. Gard, J. H. Magnusson, F. Wahlgren and G. Gille.—p. 432.
Hospital Fatality Rates for Premature Infants. K. Bain, J. P. Hubbard and M. Y. Pennell.—p. 454.
Mechanism of Emergence of Resistance to Streptomycin of H. Pertussis and H. Parapertussis During Treatment with This Antibiotic. H. E. Alexander and W. Redman.—p. 461.
*Immunization Against Pertussis During First Four Months of Life. J. J. Miller Jr., H. K. Faber, M. L. Ryan and others.—p. 468.
Meningitis in Premature Infants. B. M. Kagan, J. H. Hess, B. Mirman and E. Lundeen.—p. 479.
Diagnostic Tests for Toxoplasmosis. F. H. Adams, P. Kabler, M. Cooney and J. M. Adams.—p. 490.
Anomalous Origin of Left Coronary Artery from Pulmonary Artery (Bland-White-Garland Syndrome): Report of 4 Cases. B. M. Gasul and E. Loeffler.—p. 498.

Rickets in Newborn Infants.—Ranström and von Sydow report on 181 infants, who died soon after birth, most of them during the first two days. Only 26 of them survived more than 15 days, and the oldest was 90 days. One or two pieces of the rib, including the costochondral junction, were removed from each infant at necropsy. Microscopic examination revealed definite histologic signs of rickets in 103 of the 181 infants (56.9 per cent). Twenty of the 69 infants (29 per cent) who died during the first day of life presented rachitic changes, and in these the rickets must be considered as congenital. One hundred and seventy-three of the 181 infants were less than 30 days old, and 98 of these (56.7 per cent) showed definite rachitic changes. One hundred and fifty-four of the 181 infants were premature, and 146 of the 154 were less than 30 days old. Eighty of these 146 (54.8 per cent) showed definite rachitic changes. Thus the incidence of rickets was about the same in the premature and in the full term infants. The incidence of rickets increases rapidly with increasing age during the first weeks of life. The insufficient stores of calcium and phosphorus present at birth combined with insufficient consumption of phosphorus in breast feeding and insufficient absorption of calcium may be the cause of the rapid increase of the incidence of rickets immediately after birth.

Immunization Against Pertussis.—Miller and co-workers performed agglutinative reactions with Hemophilus pertussis on 108 pairs of maternal and cord blood serums. A correspondence in titer within the range of experimental error was

demonstrated in 83 pairs (77 per cent). The serums of 54 mothers contained demonstrable agglutinins. Thirty-four of the offspring of these 54 women had agglutinins in their cord serums. Thus transplacental transmission of antibody was demonstrated in 63 per cent of the seropositive mothers. Saline-suspended H. pertussis vaccine was administered to infants on the fifth day of life and repeated at 1 and at 2 months of age. With total doses of 50 billion H. pertussis only 6 of 41 infants (15 per cent) produced agglutinins in a titer of 1:320 or higher—the level which in older children has been found consonant with clinical immunity. This titer was demonstrated in 36 of 145 infants (25 per cent) when the total dose in a second group of infants was increased to 100 billion H. pertussis. The serologic response of infants whose cord blood had contained no agglutinins was not superior to that of infants with agglutinins. Thus no depression of the immune response by transplacentally acquired antibody was demonstrable. Saline-suspended H. pertussis vaccine in a total dose of 80 billion cells divided into three monthly injections was administered to a third group of 134 slightly older infants. The first injection was given at 4 to 8 weeks of age. Sixty-four of these infants (48 per cent) produced agglutinins in a titer of 1:320 or higher. Three months later, only 48 (36 per cent) were carrying this high titer. General febrile reactions were not uncommon, and 1 proved case of mild pertussis occurred in this group. Alum-precipitated H. pertussis vaccine was given in a total dose of 40 billion cells divided into three injections to a fourth group of 151 infants at monthly intervals. The first injection was given at 4 to 8 weeks of age. Only two febrile reactions occurred. Seventy-one of the 115 infants (62 per cent) whose serums were tested four to eight weeks later developed H. pertussis agglutinins in a titer of 1:320 or higher. Twelve months later 69 (60 per cent) still carried these high titers. This satisfactory response adds support to the thesis of Sako and co-workers that active immunization with alum-precipitated vaccine can be accomplished before the sixth month of life.

Plastic and Reconstructive Surgery, Baltimore

4:407-488 (Sept.) 1949. Partial Index

*Surgical Treatment of Elephantiasis of Lower Extremities. T. G. Blocker Jr.—p. 407.
Expeditious Use of Direct Flaps in Extremity Repairs. B. Cannon and A. W. Trott.—p. 415.
*Treatment of Recurrence of Cancer of Breast. C. E. Boys.—p. 420.
Results of Early Treatment of Congenital Anophthalmos. W. S. Kiskadden, A. J. McDowell and T. Keiser.—p. 426.
Congenital Absence of Pectoral Muscle and Syndactylism: Deformity Association Sometimes Overlooked. B. N. Soderberg.—p. 434.
Fate of Autogenous Rib Cartilage Transplanted into Nose. H. Brunner.—p. 439.
Benign Hyperplasia of Mandibular Condyle: Report of Additional Case, with Suggestion for Simplified Operative Technique. R. H. Ivy.—p. 445.
Plastic Surgery. Physiognomy and Psychoanalysis. A. Berndorfer.—p. 453.
Fat Grafts to Face. T. W. Stevenson.—p. 458.
Reconstruction of Penis with Split-Thickness Skin Graft: Case of Gangrene Following Circumcision for Acute Balanitis. P. Thorek and P. Egel.—p. 469.

Treatment of Elephantiasis of Extremities.—Blocker defines elephantiasis as a type of gravitational edema superimposed on chronic obstruction of the lymphatics, aided and abetted by repeated bouts of acute infection. Too little emphasis has been placed on the role which gravity plays in the development of progressive lymphedema of every variety. Lymphatic obstruction itself is not so much to be dreaded as the loss of circulatory equilibrium of the affected limb. Tissues which are deprived of their blood supply become vulnerable to trauma and infection. The most physiologic surgical treatment of elephantiasis appears to be the removal of skin and subcutaneous tissue en masse down to the uppermost layer of muscles and the periosteum of the tibia, coverage with large thick-split dermatome grafts and indefinite elastic support for protection against injury and the prevention of the inevitable pathologic changes which recurrence of gravitational edema would entail. The author presents 6 cases in which the aforementioned surgical treatment was employed with satisfactory results.

Proc. Soc. Exper. Biol. & Med., Utica, N. Y.

71:513-742 (Aug.) 1949. Partial Index

Cellular Transfer of Cutaneous Hypersensitivity to Tuberculin in Man. H. S. Lawrence.—p. 516.
Acetylcholine-Like Action of Product Formed by Acetylating Enzyme System Derived from Brain. S. Middleton and H. H. Middleton.—p. 523.
Is Salivary Lactobacillus Count Valid Index of Activity of Dental Caries? J. D. Boyd, V. D. Cheyne and K. E. Wessels.—p. 535.
Reactions of Normal Ovaries to Injections of Stilbestrol. G. G. Robertson.—p. 542.
*Male Mice Tolerate Dosages of Pteroylglutamic Acid Lethal to Females. A. Taylor and N. Carmichael.—p. 544.
*Effects of Pituitary Adrenocorticotropic Hormone (ACTH) in Children with Non-Addisonian Hypoglycemia. I. McQuarrie, E. G. Bauer, M. R. Ziegler and W. S. Wright.—p. 555.
Effect of Febrile Plasma, Typhoid Vaccine and Nitrogen Mustard on Renal Manifestations of Human Glomerulonephritis. H. Chasis, W. Goldring and D. S. Baldwin.—p. 565.
Inhibition by Cyanide of Serum Alkaline Phosphatase in Normal Man, Obstructive Jaundice and Skeletal Disorders. A. B. Gutman and B. Jones.—p. 572.
Healing of Tuberculous Pulmonary Cavities by Means of Skin Grafts. A. M. Vineberg.—p. 578.
Role of Complement in Lysis of Leucocytes by Tuberculoprotein. J. M. Miller, J. H. Vaughan and C. B. Favour.—p. 592.
Vasomotor Reactions in Mesenteric and Serosal Capillary Bed During Fright and Violent Muscular Activity. R. E. Lee.—p. 607.
Replacement of Portion of Common Bile Duct with Segment of Uterine Horn. C. M. O'Leary, W. T. Snoddy and B. Halpert.—p. 616.
Isolation of Anti-thyroid Compound from Rape Seed (Brassica Napus). K. K. Carroll.—p. 622.
Aureomycin in Experimental Polyarthritis with Preliminary Trials in Clinical Arthritis. W. C. Kuzell, G. M. Gardner and De L. M. Pauley.—p. 631.
Effect of Feeding Dried Egg Plant (Solanum Melonga L.) on Plasma Cholesterol. C. F. Wilkinson Jr., R. S. Jackson and W. C. Vogel.—p. 656.
Intraventricular Pressure Curves of Human Heart Obtained by Direct Transthoracic Puncture. W. C. Buchbinder and L. N. Katz.—p. 673.
Lethal Effect of Trichylene Glycol Vapor on Air-Borne Mumps Virus and Newcastle Disease Virus. S. Krugman and B. Swerdlow.—p. 680.

Sex and Tolerance for Folic Acid.—Taylor and Carmichael describe experimental studies with pteroylglutamic acid (folic acid) on mice. They found that male mice are much more resistant to injections of high dosages of folic acid than are female mice. Male mice were only slightly affected by single subdermal injections of 5 mg. of folic acid. Female mice receiving the same dosage averaged a 10 per cent loss in body weight followed by a slow recovery. There were no deaths in a group of male mice receiving 15 to 40 mg. in a single injection of folic acid. The same dosages administered to female mice were rapidly lethal in every instance. Why the female should be so much more susceptible than the male to high dosages of folic acid has not been determined.

Pituitary Adrenal Corticotropic Hormone (ACTH) in Hypoglycemia.—According to McQuarrie and his associates severe chronic hypoglycemia of the non-Addisonian type presents a difficult etiologic and therapeutic problem, unless it is found on direct examination of the pancreas to be due to a removable adenoma of the islet cells, a comparatively rare pathologic condition. The authors made repeated attempts to force the gluconeogenetic action of cortin to a degree sufficient to control non-Addisonian hypoglycemia. Although mildly encouraging in a few cases, these attempts have been largely unsuccessful. The isolation of pituitary adrenal corticotropin (ACTH) and the demonstration of its diabetogenic effects in normal adult subjects encouraged the authors to resume their earlier attempts to counteract abnormal hypoglycemic reactions by the administration of a long-acting hormonal agent having a physiologic action antagonistic to that of insulin. They studied the effects of ACTH on the fasting blood sugar level and dextrose tolerance test; on the potassium and inorganic phosphorus content of the serum; on the nitrogen, phosphorus, chloride, sodium and potassium balances; on the urinary excretion of uric acid, creatinine and adrenal corticosteroids, and on the blood eosinophil counts in 5 young children with non-Addisonian (familial) hypoglycemia. The type of response to ACTH was similar to that of the normal adult. However, under the conditions of this experiment, instead of producing a transient state of diabetes mellitus, as it does in the normal subject, the ACTH appeared

merely to reverse the hypoglycemic tendency, with return of the fasting blood sugar level and the dextrose tolerance curve to normal. Although the eosinophil count returned to normal promptly on withdrawal of ACTH, the blood sugar remained above the threshold for hypoglycemic reactions for at least ten days without ACTH in the most severe cases in the series. Administration of 18 mg. of ACTH in one dose every forty-eight hours thereafter served to maintain this patient in an essentially nonhypoglycemic state for more than three additional weeks. Results of the study suggest that ACTH may prove to be as effective in the control of this non-Addisonian hypoglycemic disorder as insulin is in the control of diabetes mellitus.

Psychiatry, Washington, D. C.

12:211-324 (Aug.) 1949. Partial Index

Medical Opinion and Social Context in Mental Hospital. A. H. Stanton and M. S. Schwartz.—p. 243.
Psychiatric Views on "Freedom" and Theory of Social Systems. L. Schneider.—p. 251.
Germinal Cell of Freud's Psychoanalytic Psychology and Therapy. P. Bergman.—p. 265.
Study of Resistance and Its Manifestations in Therapeutic Groups of Chronic Psychotic Patients. I. M. Rosen and M. Chasen.—p. 279.
Consideration of Methodology in Research on Mental Disorders. J. M. Stycos.—p. 301.

Public Health Reports, Washington, D. C.

64:1247-1286 (Oct. 7) 1949

Prospectus of Research in Mass BCG Vaccinations. C. E. Palmer. —p. 1250.
Tuberculosis Mortality Relationships—Age, Race and Sex, 1947. —p. 1261.
Tuberculosis and Its Control in Rural Areas. M. I. Roemer.—p. 1269.

64:1287-1310 (Oct. 14) 1949

Studies of Human Body Lice, Pediculus Humanus Corporis. I. Method for Feeding Lice Through Membrane and Experimental Infection with Rickettsia Prowazeki, R. Mooseri, and Borrelia Novyi. H. S. Fuller, E. S. Murray and J. C. Snyder.—p. 1287.
Health Is Everybody's Business. M. Derryberry.—p. 1293.

64:1311-1330 (Oct. 21) 1949

Concept of Multiphasic Screening. A. L. Chapman.—p. 1311.
Undergraduate Sanitary Engineering Training in the United States. C. P. Straub.—p. 1315.

64:1331-1362 (Oct. 28) 1949

Housing Act of 1949 and Health Department Programs. R. J. Johnson. —p. 1331.
Physiological Aspects of Better Housing. H. Specht and P. A. Neal. —p. 1337.
Serological Characteristics of Pathogenic Rickettsia Occurring in Amblyomma Maculatum. D. B. Lackman, R. R. Parker and R. K. Gerhoff.—p. 1342.
Industrial Sickness Absenteeism: Males and Females, 1948, and Males, First and Second Quarters, 1949. W. M. Gafafer.—p. 1350.

64:1363-1402 (Nov. 4) 1949

*Development of Calcification in Pulmonary Lesions Associated with Sensitivity to Histoplasmin. M. L. Furcolow.—p. 1363.

64:1403-1438 (Nov. 11) 1949

Effect of Topically Applied Fluorides on Dental Caries. J. W. Knutson and G. C. Scholz.—p. 1403.

Calcification in Pulmonary Lesions Associated with Sensitivity to Histoplasmin.—Furcolow points out that evidence has accumulated which suggests that histoplasmosis, formerly regarded as rare and usually fatal, also exists as a mild asymptomatic syndrome which is prevalent in certain parts of the world. The principal significance of the asymptomatic form is that in certain respects the disease so closely resembles tuberculosis that it is frequently confused with it. In both diseases there are pulmonary calcifications which are so alike in appearance as to be indistinguishable except that some occur in persons who are hypersensitive to tuberculin and others in persons hypersensitive to histoplasmin. Several hundred histoplasmin-positive, tuberculin-negative children with pulmonary infiltrates were found by periodic routine school roentgen and skin-testing surveys in Kansas City. Seventeen children whose lesions calcified have been selected for presentation in this paper. Repeated skin testing showed that the reactions of all the children remained sensitive to histoplasmin and negative to tuberculin. In general the precalcific lesions may be classified as disseminated infiltrates, pneumonic infiltrations or nodular foci. The disseminated infiltrates consist of multiple lesions scattered throughout both lung fields. The size of the individual infiltrates may be uniformly that of a millet seed or may range from a few millimeters in diameter to large conglomerate patchy areas. A central core of calcification may be seen in some of the infiltrates. Enlargement of the hilar nodes is frequently associated with this type of disease. Calcifications resulting from disseminated infiltrates are distributed throughout the parenchyma. Pneumonic infiltration usually consists of a small area of infiltration, poorly circumscribed and irregular in shape. Calcification may appear in the infiltrates as scattered small foci throughout the lesion or as a single lesion in the midst of a clearing area. Nodular lesions which were demonstrated in 8 of the 17 cases consisted of well defined, nodular shadows. A calcified central core is a characteristic finding, although in many cases the calcification appears to replace the entire lesion or develops in multiple small areas. Hilar adenopathy is pronounced in more than half the cases illustrated.

Rhode Island Medical Journal, Providence

32:469-528 (Sept.) 1949

Diagnostic Techniques for Children with Cerebral Palsy. E. Denhoff. —p. 483.
Impact of Socialized Medicine on British Physician and His Patient. C. Palmer.—p. 488.

32:529-588 (Oct.) 1949

Review of Treatment of Peripheral Arteriosclerotic Disease. G. C. Heitzman.—p. 543.
Case of Spontaneous Rupture of Aortic Valve. R. W. Phillips, F. W. Easton and M. N. Fulton.—p. 549.
Acute Hemolytic Anemia During Pregnancy: Case Report. A. M. Phillips.—p. 552.
Methyl Salicylate Poisoning (Report of Case). D. S. Howell.—p. 555.

Rocky Mountain Medical Journal, Denver

46:793-888 (Oct.) 1949

*Prevention and Treatment of Rocky Mountain Spotted Fever. G. E. Baker.—p. 812.
Presidential Address. F. A. Humphrey.—p. 828.
Psychology of the Poor Reader. W. H. Crisp.—p. 833.
Colles' Fracture with Report of End Results in 56 Cases. L. M. Overton.—p. 842.
Incidence of Homologous Serum Jaundice in Recipients of Blood Products from Belle Bonfils Memorial Blood Bank. R. S. Liggett and M. R. Rymer.—p. 845.

Rocky Mountain Spotted Fever.—Baker points out that about 500 cases of Rocky Mountain spotted fever occur each year in the United States. A suitable diet with a low fat, adequate carbohydrate and high protein intake, bedrest, good nursing care with baths and packs and attention to adequate elimination should be insisted on from the beginning, although at this stage patients frequently do not appear ill enough to make all these precautions necessary. Supportive treatment for the heart may become necessary, and care of the skin is important. Immune rabbit serum has a place in treatment, provided adequate amounts, up to 40 cc., are administered intramuscularly on or before the third day of the eruption. A trial dose of 1 cc. should be injected ten minutes before the total dose in order to ascertain that no serious reaction will occur. The initial amount of para-aminobenzoic acid in adults is 6 to 8 Gm., followed by 2 to 3 Gm. every two hours day and night. Para-aminobenzoic acid should be neutralized by administration of 20 grains (1.3 Gm.) of sodium bicarbonate for every 2 Gm. of the acid. Clinical improvement becomes evident two to four days after para-aminobenzoic acid therapy is begun. Treatment with antibiotics, particularly aureomycin and chloramphenicol, has proved highly effective. An adequate daily oral dose of aureomycin is 30 to 60 mg. per kilogram of body weight. This dose is continued for four to eight days. Chloramphenicol is also given by mouth. The initial dose is 50 to 75 mg. per kilogram of body weight, administered in two or three parts at hourly intervals. After that, it is given at three hour intervals day and night. Arbitrary amounts are 0.25 Gm. for children under 16 years of age and 0.5 Gm. for older children and adults. Rocky Mountain spotted

fever is preventable. The dose of chick embryo type vaccine is 0.5 cc. for children under 12 years of age and 1 cc. for adults and older children. Vaccine is administered subcutaneously in injections at intervals of a week or ten days. Booster immunizations are indicated each year.

Southern Medical Journal, Birmingham, Ala.

42:825-928 (Oct.) 1949. Partial Index

New Operative Procedure for Laryngofissure. E. N. Broyles.—p. 825.
*Cirrhosis of Liver: Serial Biopsy Studies. W. D. Davis Jr.—p. 828.
Spontaneous Pneumothorax in the Newborn: Report of Two Cases. D. P. Boyette.—p. 848.
Emergency Treatment of Chest Wounds. M. H. Blau.—p. 851.
Industrial Medicine Problems of Immediate Future. F. LaCour.—p. 855.
Evaluation of Lumbar Sympathectomy. R. M. Lee, F. F. Krauskopf and G. D. Lilly.—p. 864.
Use of Radioactive Isotopes in Study of Peripheral Vascular Disease. F. W. Cooper Jr.—p. 870.
Food Allergy as Cause of Pruritus Ani. F. R. Rugeley.—p. 873.
Effective Method of Intracapsular Extraction: With Review of 175 Cases. J. M. Baird.—p. 877.
Use of Whole Blood, Blood Plasma, Blood Derivatives and Blood Substitutes. R. R. Kracke and W. H. Riser Jr.—p. 882.
Place of Gastrectomy in Treatment of Peptic Ulcer. R. M. Penick Jr. —p. 888.
Ruptured Intervertebral Disc in Industry. R. C. L. Robertson.—p. 891.
Two Years' Experience with Student Clerkships in Veterans Administration Hospital. J. R. Gott Jr.—p. 895.
Teaching the Practicing Physician to Do Psychotherapy. C. A. Whitaker. —p. 899.
Psychosomatics in Gynecic Practice. W. R. Cooke.—p. 903.
Anesthesia and the Neurosurgical Patient. D. A. Davis.—p. 908.
Retropubic Prostatectomy. R. K. Womack, B. E. Trichel and J. H. Campbell.—p. 915.

Cirrhosis of Liver.—Davis reports serial biopsy observations on 16 patients, 12 men and 4 women between the ages of 29 and 61, 14 with advanced cirrhosis of the liver and 2 with severe fatty change, which he believes represents an early stage of cirrhosis. Twelve of the 16 patients were confirmed alcohol addicts, and only 2 presented evidence of previous acute hepatitis. Autopsies were made in 3 of the 4 patients who died. The follow-up period of the patients ranged from four months to four years. Eight patients were considered to be decompensated. The only patients in this group who showed pronounced clinical, laboratory and microscopic improvement were the 4 who on initial biopsy exhibited severe fatty infiltration, suggesting that fatty infiltration is a good prognostic sign in decompensated cirrhosis. Lipotropic substances, such as methionine, are of value in patients who will not or cannot take adequate nutrition by mouth. A poor prognosis is likely in patients with decompensated cirrhosis in whom microscopic changes of fibrosis and necrosis are noted, with or without inflammation, in the absence of fatty infiltration. In cirrhosis the microscopic changes of necrosis, fatty infiltration and inflammation are all reversible to a large extent.

Tennessee State Medical Assn. Journal, Nashville

42:307-338 (Sept.) 1949

Reorganization Plan No. 1. L. C. Hunt.—p. 307.
Diabetes Mellitus—Certain Practical Considerations. A. Weinstein. —p. 313.
Radium in Postnasal Lymphoid Hyperplasia and Infections. H. B. Damron.—p. 317.

42:339-374 (Oct.) 1949

Impact of Socialized Medicine on British Physician and His Patient. C. Palmer.—p. 339.
Differential Diagnosis of Lesions of Breast. C. E. Gillespie.—p. 345.
Education of General Practitioner. D. G. Miller Jr.—p. 357.

Texas State Journal of Medicine, Fort Worth

45:669-728 (Oct.) 1949

Psychosomatic Syndromes: Errors in Diagnosis and Treatment. A. E. Bennett.—p. 676.
Psychosomatic Therapy in General Practice. A. Hauser.—p. 683.
Office Procedure in Psychotherapy. M. J. Cooper.—p. 686.
Psychiatric Aspects of Rehabilitation. D. P. Morris.—p. 691.
Relationship of Psychiatry to Obstetrics. W. T. Brown.—p. 693.
Present Situation in Surgical Treatment of Peptic Ulcer. S. F. Marshall and S. A. Wilkinson.—p. 697.
Bleeding Peptic Ulcers: Report of 368 Cases. W. S. Lorimer Jr. —p. 702.

United States Naval Med. Bulletin, Washington, D. C.

49:825-994 (Sept.-Oct.) 1949. Partial Index

Experiences with Marrow Nail Operation According to Principles of Kuentscher: Fractures Healed with Deformity, Old Fractures with Deficient Callus Formation, and Pseudarthroses: Part III. C. Haebler. —p. 831.
Bronchogenic Carcinoma. T. C. Ryan and F. W. Meyer.—p. 863.
Carcinoma of Cervix Uteri. W. S. Baker.—p. 868.
Primary Sarcoma of Heart: Case Report. R. H. Walker.—p. 878.
Angiomatous Tumors of Mesentery: Report of 3 Cases. E. D. Horning and L. E. Gilje.—p. 884.
Cystic Fibrosis of Pancreas. A. M. Margileth.—p. 890.
Thrombo-Embolism. C. C. Womble.—p. 895.
Acute Lymphatic Leukemia in Childhood. P. Michael and J. L. Richardson.—p. 907.
Infectious Neuronitis Complicating Infectious Mononucleosis. S. D. Graham, W. H. Schwartz and W. L. Chapman.—p. 914.
Role of Carbohydrates in Dental Caries. G. H. Green.—p. 920.
Potassium: Clinically Significant Element. H. A. Lyons.—p. 934.
Toxemias of Pregnancy: Their Symptomatic Nomenclature. D. M. Shook.—p. 941.
Cardiac Abnormalities Among Recruit Candidates. R. I. Cottle Jr. —p. 946.
Measles Epidemic on Guam. C. K. Youngkin, M. E. Nunemaker, L. L. Battey and C. A. Glenn.—p. 950.

Urologic & Cutaneous Review, West Palm Beach, Fla.

53:577-640 (Oct.) 1949. Partial Index

*Osteitis Pubis: Urologic and Roentgenographic Study. E. W. Beach. —p. 577.
Diverticula of Female Urethra: Report of Twenty Cases. R. T. Bergman.—p. 590.
Treatment of Nephroptosis. C. W. Collings and F. C. Knight.—p. 593.
Testicular Tumor and Status of Radiation Therapy. M. L. Jacobs. —p. 599.
Prostatectomy: Critical Survey of Eleven Years' Experience in Private Practice. R. B. Mullenix, R. J. Prentiss and R. E. Delaval.—p. 602.
Reconstruction of Urethra with a Tube from Bladder Flap. R. W. Barnes and W. M. Wilson.—p. 604.
Trauma of Solitary Kidney. F. W. Lynn.—p. 606.
Some Less Common Manipulations for Removal of Ureteral Calculi. P. A. Ferrier.—p. 607.
Strongyloides Stercoralis Involving Genito-Urinary Tract. F. H. Reidewill.—p. 609.
Postoperative Urinary Retention. P. A. Rohrer.—p. 620.
Neurofibromatosis of Urinary Bladder. H. H. Pitts.—p. 623.
Present Status of Nitrogen Mustard Therapy in Dermatology. N. N. Epstein.—p. 628.

Osteitis Pubis.—Beach reports 7 men between the ages of 54 and 73 with osteitis pubis; this followed suprapubic prostatectomy in 4, bladder resection in 2 and transurethral resection in 1. Biopsy done in 2 cases revealed the bone change to be panosteitis. Osteitis pubis is an orthopedic disease engendered in the male pelvis by urologic surgery. The disease is caused by a spill of urine or septic material into the deep pelvis overspreading the nutrient foramens. Such spill must come forward anatomically because of the inherent pelvic fascial arrangement and will collect initially behind the pubic bodies, unless adequately drained, to extend later beneath the arcuate tendons and into ischial territory. Symptoms usually appear early and are characteristic. Painful spasm of the adductor thigh muscles is outstanding, and the patient can neither stand nor sit comfortably. Roentgenographically, acute bone atrophy is manifest in both pubic corpora. Prevention calls for less trauma and more drainage. Treatment is unsatisfactory. Recovery is conditioned by the severity of the symptoms and the extent of osseous change. Average recovery time in the author's cases was about three and a half months.

Yale Journal of Biology and Medicine, New Haven

22:1-108 (Oct.) 1949

Source of Phosphorus in Bacteriophage. R. A. Goldwasser.—p. 1.
Disappearance of Glucose from Incubated Blood Containing Added Electrolytes. T. S. Danowski.—p. 23.
Cancellation of Fluoride Inhibition of Blood Glucose Catabolism. T. S. Danowski.—p. 31.
Metabolism of Potassium in Diabetic Acidosis. J. W. Needham.—p. 39.
Incidental Finding of Megaloblastic-Like Cells in Bone Marrow of One of Two Swine with Macrocytic Anemia and Achlorhydria. F. D. Lawrason and E. P. Cronkite.—p. 57.
Simple Apparatus for Automatic Inoculation of Culture Media. R. A. Goldwasser.—p. 67.
Adaptation to Brief Stress: Blood Level of Leucocytes and Adrenal Function in Epilepsy, Electrically Induced Convulsions and After Injection of Epinephrine. Review and Interpretation. S. T. Michael. —p. 71.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

22:557-616 (Oct.) 1949

Radiological Localisation of Placental Site: Part I. Normal Implantation. F. Reid.—p. 557.
Differentiation of Mediastinal Tumour and Aneurysm: Value of Angiocardiography. I. Steinberg and C. T. Dotter.—p. 567.
*Pneumoconiosis in Graphite Workers. L. Dunner and D. J. T. Bagnall.—p. 573.
Osteogenic Sarcoma as Complication of Osteitis Deformans: Personal Experiences and Reflections. H. R. Sear.—p. 580.
Experimental Study of Back-Scatter with X-Ray Beams of Small Area. D. V. Mahbe.—p. 600.
Two Devices for Improving Accuracy in X-Ray Beam Direction. I. G. Brown and J. L. Howarth.—p. 605.

Pneumoconiosis in Graphite Workers.—Dunner and Bagnall say that in addition to clinical and radiologic evidence previously reported, anatomic and pathologic proof has now been obtained to justify the recognition of a graphite pneumoconiosis. They cite 2 patients, one of whom had a fatal outcome. Necropsy revealed some dense adhesions between the visceral and parietal pleura of both upper lobes. The lungs themselves were jet black, and a firm fibrous mass was palpable in all pulmonary lobes. Incision showed cavities filled with black fluid. There was no detectable communication between the cavities and the bronchial tree. The postmortem appearance was suggestive of central necrosis of the lesions. Chemical analysis of the contents of these cysts did not reveal silica, but 3.5 per cent carbon was found in the dried material. The material was sterile on culture. In addition to the large fibrous-walled cysts, there were three small fibrotic nodules. Numerous blackened lymph nodes were seen. Collections of graphite were apparent in the pleural lining of the chest wall. Microscopic examination showed massive fibrosis with compensatory emphysema around the fibrous areas. The fibrosis was localized about the blood vessels and lymphatics and had almost certainly begun in the perivascular lymphatics in which foreign bodies are deposited by macrophages.

British Journal of Urology, London

21:189-268 (Sept.) 1949. **Partial Index**

Bactericidal Properties of Some Disinfectants in Common Use. W. Hayes.—p. 198.
Retrocaval Ureter: Case Diagnosed Pre-Operatively and Treated Successfully by Plastic Operation. J. C. Anderson and W. Hynes.—p. 209.
Treatment of Vesical Neck Obstruction by Endoscopic Resection. N. E. Berry and E. P. White.—p. 215.
Gelfoam in Prostatectomy: Aid to Haemostasis. C. A. Wells and R. Marcus.—p. 223.
Primary Carcinoma of Male Urethra. H. K. Vernon and R. D. Wilkins.—p. 232.
Observation on Familial Polycystic Disease of Kidney. J. D. Ferguson.—p. 241.
Management of Anuria. A. Miller.—p. 243.

British Medical Journal, London

2:825-886 (Oct. 15) 1949

Malaria with Special Reference to Certain Experimental, Clinical, and Chemotherapeutic Investigations. N. H. Fairley.—p. 825.
Clinical Value of Pregnanediol Assays. G. I. M. Swyer.—p. 830.
Vesico-Bullous Diseases Affecting Eye. A. Carleton.—p. 835.
*Retinal Arterial Occlusion in Migraine. G. S. Graveson.—p. 838.
*Studies in Primary Pleurisy with Effusion. B. C. Thompson.—p. 841.
Aetiology of Erythema Nodosum in Children. S. A. Doxiadis.—p. 844.
Post-Operative Thrombosis: Investigation of Proposed Test for Its Prediction. G. W. V. Greig.—p. 845.
Incidence of Signs Usually Connected with Thyrotoxicosis with Special Reference to Lid Lag. W. P. U. Jackson.—p. 847.
Actinomycotic Empyema. H. W. Bowyer.—p. 848.

Retinal Arterial Occlusion in Migraine.—Graveson reports 4 instances of retinal arterial occlusion which developed during migraine. The patients were women, their ages ranging from 16 to 35. In 1 patient the central artery of the retina was affected; in 3 occlusion occurred in a single peripheral branch. Two of the patients had had attacks of migraine before the onset of the retinal occlusion, while in the other 2 the occlusion was apparently the first symptom of the disease. None of these 4 patients had signs of local retinal or generalized arterial disease, nor was there evidence of a possible source of emboli. The author feels that migraine should be considered as a possible cause of retinal occlusion when no cardiovascular disease can be found. The condition is probably less uncommon than its recorded occurrence might suggest. Three of the 4 instances here described were seen within twelve months. Their interest lies chiefly in the fact that they provide further evidence that symptoms of migraine are the result of vasomotor disturbances in the territory of cranial blood vessels.

Primary Pleurisy with Effusion.—Thompson is concerned with "primary" pleurisy with effusion, and not with "secondary" tuberculous pleural effusion that may form in the course of an artificial pneumothorax. Primary effusion was the subject of a previous investigation, in which 190 patients were studied over a period of years. Although by definition coexisting or preceding pulmonary tuberculosis was not present in this series, radiographs sometimes revealed lesions within the thorax that were typical of a tuberculous primary complex of Ghon. Since the earlier report the author had an opportunity for observing the development of pleurisy with effusion from its earliest beginnings among nurses and medical students, who undergo regular tuberculin testing and roentgen examination. The author cites 7 case histories which throw light on the pathogenesis of pleural effusion. All the patients had experienced a recent primary tuberculous infection and were under close observation before and after that event. In 6 of 7 patients a primary complex was seen to develop which was radiologically visible throughout the pleurisy in 5. One case is an example of the development of subsequent pulmonary tuberculosis while the primary complex continued to be visible in a radiograph. One way in which the pleura may be invaded from the primary complex is illustrated by cases 6 and 7, in which direct spread from the pulmonary focus was observed. Another way is shown in cases 3, 4 and 5, in which there was evidence that the lymph node component eroded the pleura near its mediastinal reflection. The opposite pleura became subsequently involved in cases 2, 4 and 5, indicating that so-called bilateral effusions are probably due to spread from adjacent lymph nodes. The latent period between primary infection and exudative pleurisy may be as short as sixteen weeks but is usually between six and twelve months. Persistence of evidence of an active primary complex should lead one to expect pleurisy in any case of recent tuberculous infection. The term "primary" pleurisy with effusion is therefore used definitively, to make clear this association, though in a strict pathologic sense it belongs to the indeterminate post-primary phase. The author concludes that primary pleurisy with effusion is an incident in the history of tuberculosis. It arises by direct pleural involvement from either the pulmonary or the glandular component of an active intrathoracic primary complex, incurred as a rule a few months previously. Especially susceptible to this condition are adolescents and young adults who have escaped the tubercle bacillus earlier in life.

Lancet, London

2:681-724 (Oct. 15) 1949

Interpersonal Factors in Illness. F. R. C. Casson.—p. 681.
*Expectant Treatment of Benign Prostatic Enlargement. T. L. Chapman.—p. 684.
Pteroyl-Polyglutamic Acids in Treatment of Pernicious Anaemia. J. F. Wilkinson and M. C. G. Israëls.—p. 689.
*Menorrhagia of Emotional Origin. J. B. Blaikley.—p. 691.
Tests for Streptomycin Sensitivity of Tubercle Bacilli in Tween 80 Albumin Liquid Medium. D. A. Mitchison.—p. 694.
Louping-Ill Meningo-Encephalitis: Further Case and Serological Survey. J. H. Lawson, W. G. Manderson and E. W. Hurst.—p. 696.
Ventricular Fibrillation Recorded Ten Hours Before Death from Myocardial Infarction. W. M. Priest.—p. 699.
Pneumonia and Empyema Due to Salmonella Oranienburg. A. M. Cooke and A. R. H. Williamson.—p. 700.

Expectant Treatment of Benign Prostatic Enlargement.—Chapman says that it is his practice to advise expectant treatment in about 20 per cent of all cases of benign prostatic enlargement referred to the hospital or seen in private consultation. In general, expectant treatment is advised when (1) residual urine is absent or small in amount, (2) there is slight or no difficulty in micturition and (3) there have been no attacks of acute retention. These conditions were fulfilled in 114 of a series of 129 patients. These patients sought advice chiefly because of frequent or hesitant micturition or hematuria.

Eighteen of the 129 patients treated expectantly died. One patient, aged 91, died of uremia. With the possible exception of this case it is unlikely that the prostate was responsible for any of these deaths. Seventeen of the 129 patients were operated on after a period of expectant treatment, 13 by the author and 4 by other surgeons. In 12 of the 13 patients subsequently operated on by the author the indication for operation was obstruction, while in the remaining case severe hemorrhages from the prostate followed a marriage late in life. The author feels that it is unjustifiable to remove the prostate merely because it is enlarged and has been associated with some urinary symptoms. Prostatic enlargement should be regarded, like the arcus senilis of the cornea and the greying and thinning of the hair, as an anatomic feature of old age, which occurs often enough to be regarded as a variety of the normal. Only when obstruction to the flow of urine is produced does it become a disease. Patients tend to seek advice in a phase of congestion. In a considerable number the chief symptom improves within a few months. The nonobstructive or only slightly obstructive prostate has a tendency to remain so. The growth of the prostate seems to slow down about the age of 60. A nonprogressive type of enlargement of the prostate exists and can be identified by the absence of difficulty in micturition and of residual urine. Such patients should be treated expectantly.

Menorrhagia of Emotional Origin.—Blaikley found only one brief textbook reference to "psychogenic menorrhagia." The importance of recognizing an emotional origin of menorrhagia lies in the possibility of cure by appropriate advice, reassurance or even formal psychotherapy and in the avoidance of unnecessary surgical treatment—even such radical operations as hyterectomy. He presents histories of 8 women in whom the proof of an emotional origin for the menorrhagia was furnished by the recovery that took place when the emotionally upset state was replaced by one of tranquility. It has been shown in other organs, such as the stomach, that it takes little to make a hyperemic mucosa bleed. He suspects that the uterine muscle is slightly irritable and that its contractions may be the final factor in causing the bleeding. What disturbance there is of endocrine function is secondary to this, and curettings do not suggest that an excess of estrogenic hormone is a factor in this menorrhagia.

Medical Journal of Australia, Sydney

2:301-336 (Aug. 27) 1949. Partial Index

Edward Stirling Lectures: II. Principles of Surgery of Skin. K. W. Starr.—p. 301.
Pre-Operative Radiotherapy in Treatment of Osteogenic Sarcoma: Preliminary Communication. R. K. Scott.—p. 304.
Indications for Operation on Injured Back. E. F. West.—p. 314.
Endometriosis. D. A. Quinlan.—p. 315.
Pregnancy and Intestinal Obstruction: Dangerous Combination. F. Bellingham, R. Mackey and C. Winston.—p. 318.

2:337-372 (Sept. 3) 1949. Partial Index

Effect of Hetero-Specific Pregnancy on Haemoglobin and Red Cell Levels in Newborn Infant. L. M. Bryce, K. Campbell, J. J. Graydon and others.—p. 337.
Chest Diseases as Seen in General Practice. A. H. Penington.—p. 343.
Surgery of Common Bile Duct. B. T. Edye.—p. 347.
Lithium Salts in Treatment of Psychotic Excitement. J. F. J. Cade.—p. 349.
*Skin Lesions Among Fishermen at Houtman's Abrolhos, Western Australia, with Account of Erysipeloid of Rosenbach. K. Sheard and H. G. Dicks.—p. 352.
*Pneumonoconiosis on Western Australian Goldfields. K. G. Outhred.—p. 355.

Skin Lesions Among Fishermen.—Sheard and Dicks observed that the efficiency of fishermen and crayfish processors was impaired by severe skin lesions primarily on the hands, knees and feet and secondarily on the nape of the neck and around the anal region. Examination of 43 fishermen showed many lesions resulting from the infection of superficial wounds by staphylococci, streptococci and erysipelothrix. There was a high incidence of devitalized skin areas on which ulcers ("salt water sores") formed. Preventive measures included protection of the hands with gloves, greater attention to personal and general cleanliness and the use of a more varied diet. Treatments included the use of nitromersol (anhydride of 4-nitro-3-hydroxymercurioorthocresol), aminacrine hydrochloride (British Pharmacopoeia) and ichthammol (sulfonated bitumen) as dressing and stannic oxide given orally against salt water sores, and penicillin therapy when lymphangitis was present. Penicillin was the treatment of choice in cases involving the serious forms of erysipeloid, as these were resistant to the sulfonamides. Erysipeloid of Rosenbach, which may be masked by secondary infections that are difficult to control until the primary erysipeloid is treated, may prove to be widespread among fishing and fish-processing communities. Its manifestations range from mild erysipeloid skin lesions to septicemia and endocarditis.

Pneumonoconiosis in Australian Gold Fields.—Outhred says that in 1925-1926 the Commonwealth Health Laboratory, Kalgoorlie, conducted a clinical and radiologic survey of men employed in the Western Australian gold fields. Since this initial survey the laboratory has carried out preemployment examinations and periodic reexamination of working miners. The author differentiates two basic components, accentuation of the reticular markings and nodulation. Reticular accentuation is present in both lung fields and is more or less uniform from apex to base and from the immediate prehilar zone to the periphery. As with reticular accentuation, nodulation may be coarse (and fairly open) or fine (and closely packed) and "soft" or "hard" in appearance. Though the nodules are discrete there is diffuseness, regularity of size and uniform symmetric distribution from apex to base and to the periphery of the lungs. In the average machine miner in Western Australia, inhaling dust of free silica content of 20 to 30 per cent, and with present standards of ventilation, wet drilling, watering down and restrictions of shot firing, the transition from normal to definite reticular accentuation takes place in eight to ten years and to classic nodular silicosis after sixteen to twenty years' mine work. About 1 in every 4 men with nodular silicosis eventually becomes tuberculous. So far as pneumonoconiosis is concerned, the only essential symptom is progressively increasing shortness of breath on exertion. Machine miners usually first find difficulty in getting to or from their working place when this entails climbing 50 feet or more of vertical ladders. Such dyspnea is considerably increased if tuberculosis supervenes or if bronchial obstruction or emphysema is present. Since the inception of the laboratory in 1925, 1,804 cases of simple silicosis and 839 cases of tuberculosis with or without accompanying pneumonoconiosis have been diagnosed. Considered as a pure fibrosis, the intrinsic incapacity from reticular accentuation is nil. Partial incapacity appears with beginning nodulation. With nodular dominance the subject usually becomes unfit for further underground work, though by no means totally disabled. Advanced massive shadows usually indicate total incapacity. All men with tuberculosis are regarded as totally incapacitated while the disease is progressive. More attention is now being given to the prevention of pneumonoconiosis in gold miners. The application of old and tried methods is being intensified, and new methods, including water jets, road consolidation and the use of aluminum dust prophylaxis, are being tried on an increasing scale.

Beiträge zur Klinik der Tuberkulose, Heidelberg

101:263-406 (July 14) 1948. Partial Index

Tuberculous Hilus Lymphoma in Adults. H. Stein.—p. 263.
Secondary Intestinal Tuberculosis: Increased Incidence and Change in Characteristics. F. Böhm.—p. 287.
Immunization Against Tuberculosis. A. Wallgren.—p. 295.
*Clinical Aspects of Coronary Air Embolism. G. Korb.—p. 323.
*Does Selective Collapse Therapy Completely Exclude Phrenic Exeresis? H. Seidel.—p. 351.
Experimental Foundations of Chemotherapy of Tuberculosis. G. Domagk.—p. 365.
*Results and Secondary Effects of TB I E 698 (Sulfathiazole-Thiosemicarbazone) in Cutaneous Tuberculosis: Mode of Action. K. W. Kalkoff.—p. 395.

Clinical Aspects of Coronary Air Embolism.—According to Korb information about air embolism of the coronary vessels has been obtained from experimental and pathologic observations, clinical material being practically nonexistent. Air embolism results when air or some other gas enters the venous system. This may occur either in the systemic or in the pulmonary circulation. Air embolisms in the coronary and cerebral vessels are regarded as the most important localizations in the

systemic circulation, in which the air or gas usually enters through the pulmonary vessels. In this type of embolism the cerebral symptoms generally predominate over those of the coronary vessels. A sensation of oppression is occasionally mentioned in the reports. There are cases that are fatal before symptoms become manifest. This largely explains the scarcity of electrocardiographic records on cases of this type. The author cites a patient who experienced intense pain and signs of collapse when a pneumothorax was induced. The clinical symptoms in this patient greatly resembled those of a myocardial infarct. Electrocardiographic records made three and six months after the incident were characteristic of a myocardial lesion but revealed no signs of an infarct. An electrocardiographic record obtained before the incident of air embolism made possible a comparison. Observations on these patients are compared with those made by other observers. According to some there is a relationship between the posture at the time of the entrance of air and the involvement of the coronary arteries. Embolization of the coronary artery in the described case occurred not while the patient was lying on the treatment table but after the posture had been changed. Sensations described by the patient corroborated this suggestion.

Does Selective Collapse Therapy Exclude Phrenic Exeresis?—Seidel points out that collapse therapy is becoming more selective, the aim being to preserve the function of as much intact tissue as possible, but also to collapse the diseased tissue to the maximum extent. This tendency has led some to dispense with phrenic exeresis. Records of 230 patients suggest that phrenic exeresis is still a valuable method. The author believes that phrenic exeresis is indicated absolutely as a selective collapse therapy in the presence of cavities in the upper part of the lower lobe. A large percentage of these cavities can be cured in a relatively short time by crushing of the phrenic nerve. Nearly 80 per cent of these cavities disappear during the first eight weeks. Preliminary pneumothorax not only makes the cure less likely but also lengthens the time required for cure. For cavities in other locations phrenic exeresis should be used only when other methods of selective collapse are impossible because of advanced age, poor circulatory or general conditions or because the patient refuses more extensive collapse operations. It is useful in the treatment of severe hemoptysis or as a preliminary treatment in active febrile exudative cases. The functional advantages of a temporary phrenic exclusion greatly exceed the disadvantages. The phrenic nerve should be approached through a transverse rather than through a longitudinal incision, because the resulting scar is much less conspicuous.

Results with Sulfathiazole and Thiosemicarbazone in Cutaneous Tuberculosis.—Kalkoff describes results obtained with a combination preparation, which has been designated as TB I E 698 and which is sulfathiazole and thiosemicarbazone. His observations were made on 75 patients with lupus vulgaris. The patients are given daily 1 Gm. of this drug in 4 divided doses over a period of several months. So far 26 of the patients have remained free from symptoms. In order to avoid relapses, treatment with the drug must be continued for a time after the patient's symptoms have subsided. Although complete failures are rare with this treatment, 9 of the patients in whom the treatment must be regarded as completed obtained improvement but not a cure. Medication had to be discontinued in 6 patients because of intolerance. The complications were severe in 4 of the patients; they included 1 death in a child. The process of healing was checked and corroborated by histologic controls.

Cuore e Circolazione, Rome

33:65-120 (April) 1949. Partial Index

*Clinical Course and Prognosis of Rheumatic Cardiopathy: Valvular Diseases of Rheumatic Origin in Persons over 45 Years of Age. V. Masini.—p. 76.

Course and Prognosis of Rheumatic Cardiopathy.—Masini reports on 438 patients with rheumatic heart disease. Ninety-six patients were between the ages of 45 and 70 years. Sixty-five patients had a history of rheumatic fever, the first attack occurring at an average age of 24 years. The valvular lesion was mitral in the majority of the cases. Heart function was fairly good in 11 cases. Auricular fibrillation occurred in 36 cases, its frequency paralleling advance in age. Twenty-eight patients had effort dyspnea. Thirty-five patients had congestive decompensation, which was controlled in 7 patients. Nineteen patients died during decompensation. Three patients died from cerebral embolism. Eighteen patients had associated arterial hypertension. Rheumatic valvular disease is frequent in persons over 45 years. Auricular fibrillation is frequent in persons over 45. The prognosis is grave in cardiac decompensation and cerebral embolism. Hypertension is an associated pathologic condition.

Journal de Chirurgie, Paris

68:593-704 (No. 10/11) 1949

*Thymectomy. A. Sicard and C. Dubost.—p. 593.
Treatment of Spontaneous Aneurysm of Subclavian Artery in the Anterior Mediastinum. G. Kapitzoff.—p. 603.
Cranioplasty in Several Stages: Treatment of Considerable Loss of Substance of Cranial Vault. P. Pertuiset.—p. 608.

Thymectomy.—Sicard and Dubost treated 3 patients with myasthenia gravis, 2 women aged 26 and 34 and a man aged 18, by removal of the thymus. He emphasizes the importance of preoperative treatment with neostigmine and atropine. Approach to the thymus was obtained by dividing the sternum transversely at the level of the second intercostal space. This procedure provides for a satisfactory exposure and reduces the risk of opening the pleura. Thymectomy is technically easy and has a favorable prognosis. The 2 women were followed for six and three months, respectively. The general condition of both was excellent. There was an increase in body weight of 15 Kg. (33 pounds) in the first patient and of 6 Kg. (13 pounds) in the second. The third patient was operated on recently. He experienced considerable improvement ten days after the operation. Satisfactory results may be obtained immediately after the intervention in some cases, while in others they may appear only after a prolonged postoperative period during which administration of neostigmine must be continued and reduced progressively.

Nordisk Medicin, Stockholm

42:1557-1588 (Sept. 30) 1949. Partial Index

Results of Treatment of Sterility. S. Genell.—p. 1557.
*Results of Treatment with Digitalis and Strophanthin. E. Gripwall.—p. 1564.
Hypertensive Encephalopathy and Cerebral Angiospasm. Clinical Viewpoints. G. Birke.—p. 1567.

Results of Treatment with Digitalis and Strophanthin.—Gripwall says that strophanthin given intravenously has an almost instantaneous effect, primarily on the contractile elements of the heart. Digitalis given orally acts slowly, its maximal effect appearing in forty-eight to seventy-two hours. It influences primarily the conduction system of the heart and has a marked cumulative effect, which strophanthin lacks. The main indication for intravenous strophanthin therapy is acute cardiac weakness, particularly insufficiency of the left ventricle. The result is often life saving. Even in more chronic cases of left heart insufficiency, coronary insufficiency and long-continued hypertension strophanthin seems to be superior to digitalis. The dosage is as a rule 0.25 mg. of strophanthin daily, with 10 cc. of aminophylline or 10 cc. of 25 per cent dextrose solution. After a series of ten injections the patient is usually given chronic digitalis medication. Toxic symptoms are rare. Digitalis is indicated mainly in cardiac insufficiency with palpitation and especially with auricular flutter. Digitalis preparations are more effective in auricular flutter without cardiac insufficiency. In more grave cases with marked symptoms of insufficiency, digitalis is given intravenously in the form of digilanid® or cedilanid® in a dose of 4 cc., sometimes divided in two doses to improve tolerance. The crystalline extract digitoxin does not appear to be superior to leaf digitalis and presents a greater risk of toxic by-effects. In acute coronary occlusion with shock, most clinicians consider digitalis and strophanthin contraindicated if the condition does not directly threaten life. During recent years cedilanid® has been applied increasingly and seems to offer advantages because of its rapid effect, slight cumulation and therapeutic usefulness.

Book Notices

THE REVIEWS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES AND DO NOT REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED.

Blood Transfusion. By H. F. Brewer and others. Edited by Geoffrey Keynes. Cloth. Price, $12.50. Pp. 574, with 100 illustrations. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

This volume is composed of ten sections, each confined in subject matter to a single broad aspect of blood transfusion. In the preface the editor states that he felt competent to write only concerning the history of transfusion, which account appears in the first section. Since his own experience encompasses the entire modern period of transfusion, that portion is presented with the sureness of firsthand knowledge. This brief survey is most complete and entertaining. The writing of other sections was delegated to contributors whose special interests and experiences gave them recognized expertness in the fields assigned. In this he met with remarkable success, for all speak with undoubted authority.

Eight collaborators have divided the discussion of the indications for transfusion, the complications, the blood groups, the donor, the technic of transfusion, transfusion in infancy, the storage of blood and blood derivatives, blood substitutes and the organization of a hospital transfusion service. The presentation of the clinical aspects of transfusion is thoroughly done and so arranged that discussion of a particular point may be discovered easily. The section dealing with the blood groups is detailed, as is demanded by the subject. Included is consideration of all laboratory procedures, inheritance of blood groups and the clinical significance of the Rh types as well as medicolegal implications of blood grouping. The remaining sections deal with the technics and organization of transfusion services. Principles of blood preservation and the preparation of blood derivatives are elucidated. The London Blood Transfusion Service, which serves as an example of a large transfusion organization, is described. Meriting special notation because of its uniqueness is the portion devoted to the psychology of the donor.

In spite of the sizable number of contributors, there is a minimum of overlapping in discussion, which bespeaks skilful editing and careful collaboration. Each section is supported by an extensive bibliography, which adds to the volume's worth as a reference work. The book will excite the interest of all physicians whose patients require transfusion, that smaller group of doctors who conceive and operate transfusion services and members of organizations concerned with the problem of blood procurement.

Nursing Care of Neurosurgical Patients. By Roland M. Klemme, M.D., F.I.C.S., F.A.C.S., Professor of Surgery, St. Louis University School of Medicine, St. Louis, Mo. Cloth. $5. Pp. 117, with 61 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1949.

This book is a compilation of the author's lectures on neurosurgical nursing. He briefly reviews neuroanatomy, neurologic signs and symptoms and neurosurgical procedures and operations. Preoperative and postoperative nursing care are similarly outlined. In view of the cursory treatment given to the highly specialized subject of neurosurgical care, it would appear that too much space has been devoted to those phases of nursing care which are routines in the hospitals of the author's affiliation and which often vary with individual institutions. The illustrations of the surgical instruments and the lists of equipment required for neurosurgical operations will help familiarize the nurse with her responsibilities in the operating room, although again specific items will vary with the surgeon.

In appreciation of the vital importance of intelligent nursing care for the neurosurgical patient, the author has pointed out salient fundamentals of such care. However, for student use, this book has limited value, because there is not a clearcut correlation between the outlined steps in neurosurgical nursing care and the anatomic, physiologic and clinical aspects from which this care is evolved. For graduate nurses, it would be an adequately instructive source for a quick cursory review.

Physiology in Diseases of the Heart and Lungs. By M. D. Altschule, Assistant Professor of Medicine, Harvard Medical School, Boston. Harvard University Monographs in Medicine and Public Health Number 10. Editorial Committee: A. Baird Hastings, Chairman and others. Cloth. $5. Pp. 368. Harvard University Press, Cambridge 38, Mass., 1949.

As the author states in his preface, this book is written primarily for third and fourth year medical students who would like an explanation of the manifestations of disease in terms of what they learned in their basic science courses. Thus, the book is actually a treatise of applied physiology of the heart and circulation. More than one half of the book is concerned with an excellent presentation of the physiologic mechanism in chronic cardiac decomposition. After discussing each item separately, the author wisely collates his material with a concluding section entitled, "A Generalization Concerning the Pathogenesis of the Signs and Symptoms of Congestive Heart Failure." Acute pulmonary edema is discussed in a separate section. There are also sections on angina pectoris, cardiac arrhythmias, pericarditis, congenital defects and pulmonary conditions which affect the heart secondarily. There is an extensive bibliography after each section.

This monograph is up-to-date, concisely written and authoritative. It will be of more value to medical students than to practicing physicians because treatment is considered only in so far as it is related to physiology, and the etiologic aspect of diseases of the heart is not considered at all. It is an excellent reference book, not a textbook.

Die Chirurgie des praktischen Arztes unter besonderer Berücksichtigung der kleinen Chirurgie und der dringlichen Chirurgie. Von Professor Dr. Erich Rosenlag, Direktor des chirurgisch-poliklinischen Instituts der Universität Leipzig. Fourth edition. Half-cloth. $17.25; 57 marks. Pp. 1090, with 848 illustrations. Georg Thieme, Diemershaldenstrasse 47, Stuttgart-O; imported by Grune & Stratton, 381 4th Ave., New York 16, 1947.

This is a textbook of surgery for students and practitioners by a single author who attempts to cover the entire field of surgery. A general section is devoted to a detailed description of aseptic technic, anesthetic agents, the control of hemorrhage, minor surgery and the treatment of wounds, surgical infections, tumors, fractures and dislocations. The special section comprises a discussion of the technical methods employed in the surgical treatment of diseases of the head, neck, oral cavity, nose, chest, lungs, heart and great vessels, in genitourinary surgery and in abdominal surgery. It is manifestly impossible for one author to write a modern treatise covering such a wide field, and that is perhaps the principal shortcoming of this volume. The reviewer is surprised to find so little attention paid to preoperative and postoperative care, fluid and electrolyte balance, the nutrition of the patient who is to undergo surgical procedures, antibiotic therapy and such technical procedures of proved value as postoperative gastrointestinal decompression. While these omissions are doubtless due to the author's unfamiliarity with recent American surgical literature, there are compensating features which make this volume a worth while contribution to surgical literature. The detailed and painstaking description of method is reminiscent of former German surgical scholarship and, as such, will prove interesting to a new generation of surgeons. It cannot be recommended as a textbook for medical students.

Public Health and Hygiene: A Students' Manual. By Charles Frederick Bolduan, M.D., Surgeon (R) United States Public Health Service, and Nils William Bolduan, M.D., Chief, Pediatric Service, St. Francis Hospital, Santa Barbara, Calif. Fourth edition. Cloth. Price, $4.25. Pp. 423, with 85 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, 1949.

Part I (General Introduction) traces the history of public health from biblical times through the middle ages up to modern times and is excellent background for the student. The chapter on the life history of certain important insects is well written and reflects the extensive experience of the junior author, particularly in his work as a malariologist. Some of the more important topics, such as immunity, serum and vaccine therapy, chemotherapy and antibiotics have too little space devoted to them and are not as up-to-date as they could be; for example, aureomycin and chloramphenicol are not even mentioned.

Part II (The More Important Communicable Diseases) begins with a discussion of tuberculosis and BCG vaccine but does not

V 1
195

cover the subject thoroughly. Typhoid, scarlet fever, pneumonia, whooping cough, undulant fever, tetanus and the exanthemas are glossed over with little discussion and space devoted to them. The chapter on venereal diseases could be greatly enlarged. So could the chapter on the diseases of the central nervous system and poliomyelitis. However, the discussion on helminthiasis is excellent.

Part III (Important Noncommunicable Diseases and Conditions) briefly covers nutritional disorders, diabetes, heart disease, cancer, endocrine disturbances and accidents. The subject of allergy is lightly treated, and newer knowledge about the antihistaminics is not mentioned.

Part IV (Community Hygiene) deals with water supply, sewage disposal, food and milk control and some industrial hygiene. It also discusses infant hygiene, childbearing and public health nursing. This part is well written and most informative.

Part V (Health Administration) describes the organization of the federal health services, the Social Security Act, National Cancer Act, Venereal Disease Act, Hospital Survey and Construction Act, National Mental Act and Water Pollution Control Act. State and local health administration is discussed briefly. Epidemiology, the endemic index and vital statistics are included.

The authors have revised the text of the third edition and have added some new material. Much of this material is taken from the experience of the authors in the field of public health. The book is readable and written in an attractive style. A book of only 400 pages could not be expected to cover all aspects of Public Health in detail, and this one is not an exception. It is a students' manual and fulfils the authors' purpose of making the field of public health interesting and attractive to the student.

The ABC of Acid-Base Chemistry: The Elements of Physiological Blood-Gas Chemistry for Medical Students and Physicians. By Horace W. Davenport. Second edition. Paper. $2. Pp. 74, with 20 illustrations. The University of Chicago Press, 58th St. & Ellis Ave., Chicago 37; Cambridge University Press, Bentley House, 200 Euston Rd., London, N.W. 1; W. J. Gage & Co., Ltd., Toronto 2B, 1949.

The purpose of this book is to provide the medical student and the physician with a comprehensive outline of the elements of physiologic blood-gas chemistry. The short, lithoprinted text is divided into 30 parts, the titles of which serve as an index. Some of the subjects treated are the partial pressures of gases, the mass action equations as applied to the carbonic acid-bicarbonate equilibrium, the composition of alveolar gas, the carriage of oxygen and carbon dioxide in blood, the buffer action of hemoglobin, the distribution of ions between plasma and erythrocytes, the buffer value of separated plasma, oxygenated whole blood and reduced blood, concepts of fixed acid and base, chemical regulation of respiration and respiratory and renal compensation for metabolic alkalosis and acidosis. Diagrams are profusely used to illustrate the text. Numerical examples are worked out to help the student gain a working knowledge of the subject. The value of the book might have been increased by a greater rigidity of treatment.

Der Morbus Besnier-Boeck-Schaumann: Chronische epitheloidzellige Retikuloendotheliose oder Granulomatose. Von Dr. Med. Stefan J. Leitner, Chefarzt des Bernischen Sanatoriums Le Chamossaire in Leysin. Second edition. Cloth. 38 Swiss francs. Pp. 264, with 90 illustrations. Benno Schwabe & Co., Klosterberg 27, Basel 10; Imported by Grune & Stratton, Inc., 381 4th Ave., New York 16, 1949.

Leitner's book on sarcoidosis, or, as the author prefers to call it, "chronic epithelioid cell granulomatosis," is a most exhaustive and excellent monograph. After an erudite historical introduction and a lucid discussion of the microscopic anatomy, the clinical symptomatology is presented. This part of the work is arranged according to organs and organ systems involved. The more common manifestations of the disease, such as those in the eye, skin, bones, lungs and lymph nodes, are discussed in great detail. The less common syndromes resulting from involvement of the heart, pleura, hemopoietic system, kidneys, gastrointestinal tract, endocrine glands, muscles and central nervous system (including sarcoidal diabetes insipidus) are also adequately covered. Special chapters deal with anomalies of plasma protein composition, disturbances of mineral metabolism, prognosis and therapy. The systemic nature of the disease is emphasized throughout the book.

The author reviews the world literature completely and integrates it with his own experience, which is based on thorough observation of 36 cases over a period of many years.

Perhaps the most remarkable chapter is that dealing with investigations on the etiology of sarcoidosis. With commendable objectivity the author lists all the theories and the supporting evidence in favor of these theories. He comes to the conclusion that at present the theory of tuberculous origin is relatively best supported by clinical observation and experimental evidence, although the assumption that sarcoidosis is a specific entity of unknown origin cannot be excluded definitely as yet. Connection with other assumed etiologic agents, such as lepra bacilli, Brucella and Monilia, are regarded as highly improbable, as is the conception that sarcoidosis is not an entity but a particular tissue reaction in response to different agents.

Life and Morals. By S. J. Holmes. Cloth. $3. Pp. 232. The Macmillan Company, 60 5th Ave., New York 11, 1948.

Physicians are becoming increasingly aware of the importance of ethical considerations, not only in their own practice but, more importantly, in the affairs of their patients. This helpful volume by Professor Holmes may be used advantageously by physicians and their patients as well. Professor Holmes offers a practical discussion of moral problems at the everyday level of human conduct. His point of view is refreshing and offered in a soundly common sense manner. There is none of the irritating semantic hair splitting which so often ruins the work of professional ethicists. The volume is consistently free from any reliance on supernaturalism or authoritarianism.

Professor Holmes' consideration of morals is based on an evolutionary position. Human nature is considered in the light of Darwinism, and the evolutionary origin of altruism is emphasized. In a practical and pragmatic manner Professor Holmes discusses such controversial questions of right and wrong as divorce, birth control and euthanasia. He discusses the justification for war and considers optimistically the expanding moral horizon. It is pointed out that natural selection has had a place in the evolution of morals. Recommending the use of the scientific method as an approach to ethics, Professor Holmes indicates what might be accomplished in such a consideration of the broad moral problems of our civilization involving political injustice, poverty, crime and war. There is an excellent bibliography and a useful index.

Allergie 48. Travaux publiés sous la direction du professeur Pasteur Vallery-Radot. Par E. Bernard et al. Paper. Pp. 192, with 9 illustrations. L'Expansion Scientifique Française, 23 rue du Cherche-Midi, Paris 6e, 1949.

This monograph is composed of 29 papers contributed by 34 authors. The individual contributions vary considerably in type and consist of case reports, new pieces of experimental work, clinical therapy evaluations, theoretic discussions and comparisons of the status of allergy practice in the United States and France. The following titles of some of the contributions will serve to illustrate the nature of the monograph: "Therapeutic Activity of Derivatives of Thiodiphenylamine in Allergic Conditions"; "The Chemistery of Antigens and Antibodies"; "Action of Histamine and Antihistamines on Capillary Permeability"; "The Allergic Nephritides of Infectious Origin"; "Allergy to Ricin"; "Individualization of Skin Tests"; "Allergic Manifestations and Hypophysis-thyroid-ovarian Hormone Disturbances"; "House Dust Allergy," and "The Development of Allergology in the United States."

The author of the paper last mentioned wonders why the Americans have made so much more progress than the French in the study of allergy, although the French were the pioneers. He believes that the answer lies in the matter of scientific organization. The latter in the United States has resulted in interest, collaboration between the laboratory and the clinic, widespread application of practice in allergy and progress in commercial preparation of testing and treatment materials.

This volume is undoubtedly one of the better European publications on allergy. Although much of the material is not new, some of the contributions are résumés of recently published work of considerable basic interest. To the American reader this little book serves best to portray the status of allergy in France. French progress in the study of allergy is showing signs of improvement.

Pollen-Slide Studies. By Grafton Tyler Brown, M.D., F.A.C.P., Instructor in Clinical Medicine, Georgetown University School of Medicine, Washington, D. C. With a Foreword by Wallace M. Yater, M.D., M.S., F.A.C.P., Director, Yater Clinic, Washington, D. C. Cloth. $6. Pp. 122, with 98 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill., 1949.

This is a small monograph consisting of a brief description of the technic of pollen counting, day by day pollen and spore counts of Washington, D. C., for two seasons, drawings and microphotographs of the pollen and several of the spores encountered in that area, a brief description of these pollens and a short discussion of weather factors with respect to pollination. This volume should be useful to allergists and allergy technicians in the area represented by the District of Columbia but will not satisfy workers in California, Louisiana, Ohio, Arizona and most of the other parts of the country. Over 20 pages of tabular material concerning day by day pollen and spore counts exclusively for Washington, D. C., during 1938 and 1941 cannot possibly be of great interest to those in the country at large. Although the drawings and microphotographs are of fair quality, it is difficult to justify the publication of the material except as a paper in a local medical or other scientific journal.

Physiology in Health and Disease. By Carl J. Wiggers, M.D., D.Sc., F.A.C.P., Professor of Physiology and Director of Physiology Department in the School of Medicine of Western Reserve University, Cleveland, Ohio. Fifth edition. Cloth. $10. Pp. 1242, with 279 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1949.

There was a time when the discussion of physiology was confined primarily to medical schools. However, the practice of medicine today is incomplete without knowledge of physiology. Wiggers' book provides an excellent source of material for those who wish to be acquainted with the physiology of the body and the application of this physiology to healthy and diseased tissues. There are 68 chapters divided into 10 sections. These sections are concerned with discussions on muscular contraction and associated phenomena, the physiology of the peripheral and central nervous systems, blood, respiration, heart and circulation, physiology of the alimentary tract, metabolism and nutrition, excretion and body fluids and endocrine organs. This is an extensive work that is a worthy addition to all medical libraries.

Injuries of the Brain and Spinal Cord and Their Coverings: Neuro-Psychiatric, Surgical, and Medico-Legal Aspects. Edited by Samuel Brock. Contributors: Bernard J. Alpers and others. Third edition. Cloth. $10. Pp. 783, with 125 illustrations. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

This book is the outstanding book in its field and is deserving of the favorable reception it has received. For the most part the book has been thoroughly revised, and new chapters have been added concerning injuries to the vertebral column, including herniation of intervertebral discs, the neuroses which follow injury to the head and the effects of electric shock on the nervous system. The various authors of this book are among the leading members in the fields of neurology, neurosurgery and psychiatry. They have been some of the principal students of the various effects of injury to the nervous system. The most important references to the literature are given, and there is a satisfactory index. This book can be unhesitatingly recommended as a source of reliable, tested and conservative information.

Human Pathology. By Howard T. Karsner, M.D., LL.D., Medical Research Advisor to the Bureau of Medicine and Surgery, United States Navy. Seventh edition. Cloth. $12. Pp. 927, with 576 illustrations. J. B. Lippincott Company, 227-231 S. 6th St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C. 2.; 2003 Guy St., Montreal, 1949.

Dr. Karsner's comprehensive and conservative text on human pathology is a worthy successor to the preceding editions and maintains all their good qualities. The book has been extensively revised. Two new chapters, one on diseases of the eye and the other on diseases of the skin, make valuable additions to the volume. Several hundred references and illustrations have been added, and a considerable portion of several chapters has been rewritten. The revisions of the subject material are a conservative evaluation of the developments in pathology which have occurred since the publication of the preceding edition. The publication of a new edition of this standard work on human pathology is timely, and the volume can be recommended both as a textbook for the student and a reference book for the physician.

Mobilization of the Human Body: Newer Concepts in Body Mechanics. By Harvey E. Billig, Jr., M.D., F.I.C.S., and Evelyn Lowenadahl, M.A., Ph.D. Cloth. $3. Pp. 65, with 25 illustrations. Stanford University Press, Stanford University, California; Oxford University Press, Amen House, Warwick Sq., London, E.C. 4, 1949.

This highly interesting monograph presents information which long ago should have been in the armamentarium of the medical profession rather than in other hands.

The book is well written and readable. Good paper with large type and most excellent illustrations are used.

As is stated in the preface, the use of mobilization for body mechanics is not a new concept. Many in orthopedic practice have utilized manipulation, especially in the treatment of low back pain and occipital headache. Both writers have had a long experience in physical medicine and orthopedics, and the content of the book is based on sound anatomic and physiologic principles. The first three chapters are of special interest to the orthopedic surgeon in the late treatment of fractures and should be read by the general surgeon, the general practitioner, the gynecologist and the neurologist. The chapter on coordination and mobility should be of special interest to the industrial physician. This book should be read, however, by all in the medical profession as well as by nurses and the personnel men in industry.

It is regrettable that there are not more books of this kind available.

Evolution of the Forebrain: The Fundamental Anatomy of the Tetrapodphalon with Special Reference to That of Testudo Geometrica. By G. W. H. Schepers, D.Sc., M.D. Produced by Means of a Grant from the South African Council for Scientific and Industrial Research. Cloth. 50s. Pp. 212, with 250 illustrations. Maskew Miller, Ltd., P. O. Box 396, Cape Town, South Africa, 1948.

Fundamentally this is a systematic study of the brain of the South African tortoise, Testudo geometrica. It is obvious that this study has been searching. It is well presented in the text and extremely well illustrated by line drawings. In addition to the anatomic study, the author has made some limited physiologic observations on the results of stimulation and partial ablation of the brain in this species. There is a good survey of the relevant literature and an interesting theoretic discussion of the evolution of the forebrain in the light of these researches. Unfortunately this book does not have an index.

The Life and Time of Jehudah Halevi. By Rudolf Kayser. Translated from the German by Frank Gaynor. Cloth. $3.75. Pp. 176. Philosophical Library, Inc., 15 E. 40th St., New York 16, 1949.

From the title one would assume that this would be a biographic sketch. In actuality less than half of the content concerns itself with this great Jewish Arabian physician and poet. With plodding thoroughness, the author begins the times of Halevi 500 years before his birth and ponderously wrestles with the philosophic and scientific import of the Arabic invasion of Europe on the western world. When at long last Halevi is considered, a good impression of his poetic fervor and philosophic concepts is gained by the use of frequent quotations from his poetry and his "Al Khazari." However, the reader never gets the faintest inkling of Halevi's physical appearance, personal experiences or family life. Thus, the picture drawn by the author lacks depth and dimension.

The Best Medicine & Other Stories. By Frederic Loomis, M.D. [Anthology Compiled by Evalyn Loomis.] Cloth. $2.75. Pp. 71, with 1 portrait. Loomis Book Company, 510 Park Way, Piedmont 11, Calif., [n. d.].

This small book is a collection of 17 short stories by Dr. Frederic Loomis which have appeared in various magazines in recent years. They have been collected by his widow, Evalyn Loomis, and compiled in this anthology to perpetuate his memory. Those who have read these stories or have listened to Dr. Loomis will want to read them once again, for they contain much of the charm that made Dr. Loomis a delightful story teller.

The Origin of Medical Terms. By Henry Alan Skinner, M.B., F.R.C.S., Professor of Anatomy, University of Western Ontario, London, Canada. Cloth. $7. Pp. 379. Williams & Wilkins Company, Mt. Royal & Guilford Aves., Baltimore 2, 1949.

This is an interesting collection of words and names and their origins and meanings, arranged in alphabetical order. As an occasional reference source it undoubtedly will be useful.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CONVALESCENCE FOLLOWING HERNIOTOMY

To the *Editor*:—How long should a patient be kept in bed following a hernia operation? How long should he remain in the hospital? How long should he be kept from his normal work? J. H. Hamm, M.D., Benson, Ariz.

ANSWER.—During the past decade surgeons have decreased postoperative bed rest after hernioplasty. Today some surgeons, in uncomplicated cases, permit the patients to sit up for twenty minutes on the first postoperative day and to walk a few steps around the bed. Others keep patients in bed five days. However, a consensus on the optimum postoperative bed rest has not been reached except that the older routine providing twelve days' postoperative bed rest has been changed, with benefit to the patients; the majority of hernia patients are now discharged from the hospitals on the ninth postoperative day.

If manual work is not involved, patients may resume their work five weeks after operation. Those who can regulate their own hours may do some work sooner. For laborious work two additional weeks for convalescence may be allowed. It was formerly the custom to advise longer convalescence after double than after single hernioplasty; with modern technics there is little basis for this distinction. Of course, with strangulation or postoperative complications the period of convalescence must be lengthened to fit the circumstances.

Workmen's Compensation Boards in different states vary in the length of time for convalescence which they accept as reasonable. Since the changes in surgical procedures are recent and not yet uniform, the boards continue with the old standards. For example, the New York Workmen's Compensation Board accepts the presumption that eight weeks of convalescence are required after single hernioplasty, ten weeks after double and an additional two weeks if the hernia was recurrent.

TRICHOMONAS VAGINITIS

To the *Editor*:—How does one treat an infection with Trichomonas vaginalis in the cervical glandular structure? The patient is single, age 33, and has had the usual treatments by different gynecologists. Would refrigeration with ice and a sound in the cervix as a conductor aid?

D. Guilford Dudley, M.D., Endicott, N. Y.

ANSWER.—Detailed discussion of several methods of treatment of commonly encountered Trichomonas vaginitis may be omitted here. Appropriate medicaments, such as sulfonamide cream and lactic acid douches and diet should be employed in conjunction with the special measures to be discussed. Patients with abundant cervical discharge, even if it is essentially bacteria-free mucus without notable infection, are difficult to treat for vaginitis due to Trichomonas vaginalis. Temporary relief may be obtained, but recurrence is the rule even in cases in which the husband is not a carrier and there are no other discoverable sources of reinfection. In such cases, the cervical canal must be kept open for adequate drainage and the hypertrophic hypersecreting glands should be destroyed. Drainage of the cervical canal can be maintained and reduction in the number of secreting glands may be effected by dilation done in the office with a uterine applicator which has been dipped in 5 per cent trichloracetic acid. Often, fine Hegar dilators should also be used. In more intractable cases, one may resort to gentle office treatment with an endocervical electric cautery knife. Some gynecologists advocate immediate conization of the cervix. The cautery is preferred in moderate conditions, hospitalization with bisection of the cervix and wedge excision of the cervical lips and redundant endocervical hypertrophic and eroded tissue being reserved for more serious conditions, particularly those with complicating cervical laceration. This lesser surgical procedure leaves the patient with a normal cervix, free from any hazard of dystocia in the event of subsequent pregnancy.

In response to the questioner's dubious attitude relative to excision or cautery: they are not radical if done gently, with proper respect for the affected tissues. Refrigeration with ice and use of an indwelling sound or stem are not recommended.

TITER OF RH AGGLUTININS

To the *Editor*:—Please give the procedure and technic involved in checking the titer of Rh agglutinins in pregnant women. I would appreciate information relative to the bovine albumin used in the test.

Clara E. Knauf, M.D., Lake City, Iowa.

ANSWER.—Tests for Rh antibodies should be done on all Rh-negative expectant mothers with Rh-positive husbands. Since Rh antibodies may be either univalent or bivalent or both, a satisfactory study would include not only a test by the agglutination method to detect bivalent antibodies but also a test by the conglutination method to detect univalent antibodies. Another sensitive and specific test for univalent antibodies is the antiglobulin test, while the blocking test will detect univalent antibodies only when they are present in high titer.

Agglutination Test. To carry out the antibody tests, one must have on hand a number of group O bloods of known Rh type. Saline suspensions of these are prepared and washed once by centrifuging; the supernatant fluid is decanted and the sediment resuspended in enough saline solution to produce a 2 per cent concentration of cells. A drop of each blood suspension is transferred to a correspondingly numbered small test tube; to each tube is added a drop of the expectant mother's serum, and the mixtures are allowed to react in a water bath for an hour. The reactions are read first by examining the sediment pattern, and then, after gently tilting the tube to dislodge the sediment, the mixtures are examined for clumping with the naked eye and under the low power of the microscope. The readings should be taken blind, that is, with no identification to indicate which blood specimens are Rh negative and which are Rh positive. If the Rh types of the standard blood suspensions can be determined correctly with the expectant mother's serum, then the serum contains anti-Rh agglutinins. To titrate Rh agglutinins shown to be present in a serum, a series of progressively doubled dilutions of the serum are prepared with saline solution, 1:2, 1:4, 1:8 and so on, and 1 drop of each dilution is transferred to a corresponding tube of a series, and to each tube is added a drop of a suspension of group O, Rh-positive blood. The mixtures are incubated and the reaction read as already described. The agglutination titer is calculated equal to the reciprocal of the highest dilution of the patient's serum giving a distinct (1 plus) reaction. The titration should be done at least in duplicate against two different Rh-positive blood suspensions and the average of the two titers reported as the expectant mother's Rh agglutinin titer.

Conglutination Test. As in the agglutination test, a number of saline suspensions of known Rh-positive and Rh-negative group O blood specimens are prepared and mixtures are set up with the patient's serum in a corresponding series of tubes. After the mixtures have been allowed to remain in a water bath for an hour and the cells have completely sedimented, the supernatant fluid is removed with a fine capillary pipet as completely as possible and discarded. To each of the tubes is then added a large drop of albumin-plasma mixture. The latter is prepared by mixing 4 parts of pooled fresh oxalated plasma with 1 part of 30 per cent bovine albumin (Armour), or 1 part of 25 per cent human albumin (Cutter). The sediments are resuspended and the mixtures allowed to react at body temperature for another hour. The tubes are then shaken, somewhat more strongly than for the agglutination test, and the mixtures examined for clumping. To titrate univalent antibodies, a series of saline dilutions of the expectant mother's serum are mixed with Rh-positive cells and allowed to react for one hour. The supernatant fluid is removed and replaced by a large drop of albumin-plasma mixture, the sediment resuspended and reincubated, and at the end of an hour the reactions are read as previously described.

Antiglobulin Test. For this test it is necessary to have on hand anti-human serum (rabbit) for the antiglobulin test, a product which is commercially available. Again, as in the other tests for Rh antibodies, a drop of the patient's serum is placed in each of a number of tubes, to which are added different Rh-positive and Rh-negative group O blood suspensions. These mixtures are allowed to react for an hour or longer at body temperature. Each tube is then filled with saline solution and centrifuged and the supernatant fluid decanted. The sedimented cells are then resuspended in a large volume of saline solution, and this washing process is repeated three times. The washed cells are finally resuspended in 1 drop of saline solution. To each tube is then added a drop of the anti-human serum for the antiglobulin test. The mixtures are shaken and after standing for a few minutes are centrifuged at low speed (500 r.p.m.) for one minute. The tubes are then gently shaken and read

for clumping with the naked eye and under the low power of the microscope. Ability to identify correctly "blind" the Rh-positive and Rh-negative control bloods proves that the expectant mother is sensitized to the Rh factor. By making the appropriate modifications, it is possible to titrate the Rh antibodies also by the antiglobulin method.

References:

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Coombs, R. R. A.; Mourant, A. E., and Race, R. R.: A New Test for the Detection of Weak and "Incomplete" Rh Agglutinins, Brit. J. Exper. Path. 26: 255, 1945.

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TUBERCULOSIS AND PNEUMOGENIC MALIGNANCY

To the Editor:—What is the incidence of primary pneumogenic malignant neoplasms in the presence of pulmonary tuberculosis, active or arrested?

C. D. J. Gonzales, M.D., New York.

Answer.—Recent work seems to indicate there is about the same incidence of carcinoma in patients with tuberculosis as in the general population. Drymalski and Sweany (*Am. Rev. Tuberc.* 58:203 [Aug.] 1948) found 15 cases in 2,000 autopsies (0.75 per cent). This group represented all the cases of healed and active disease wherein tubercle bacilli had at one time been found. The older dictum of an antagonism between the two diseases is probably to be explained by the fact that the impression was gained at a time when the two diseases appeared more in the extremes of life—tuberculosis in the young and carcinoma in the old. The over-all figures would tend to show a lower incidence of the two diseases together because there would be few cancers in the young, in whom most of the tuberculosis formerly occurred. Of recent years, there has been a decided decrease of tuberculosis in the young, in whom there never was much carcinoma. The two diseases probably retain a more normal relationship in the latter half of life. There is an apparent if not real increase in the incidence of carcinoma and tuberculosis in the older age groups during the last twenty-five years. In the study referred to there were 57 instances of lung cancer, 15 (26 per cent) having had tubercle bacilli at one time, with 5 instances (9 per cent) of florid tuberculosis. Although the percentage of tuberculosis in this group is much greater than that of the older age groups in the general population (1 to 3 per cent), it is probably not far removed; the work of Sweany, Levinson and Stadnichenko (*Am. Rev. Tuberc.* 58:131 [Sept.] 1943) indicates that tubercle bacilli are found in about 20 per cent of persons dying of other diseases. This work was performed on patients in the latter half of life.

UNDESCENDED TESTICLE

To the Editor:—A 21 year old man has had a mass over the inguinal region since early childhood. This was diagnosed as hernia, to be repaired at a later date. During adolescence nervous spells developed, which grew worse as the years passed. The patient went to college but after a few months was compelled to return home because of nervousness. Outdoor work seems to agree with him, but book work causes him to become nervous and upset. He is able to do any type of manual labor and, aside from nervousness, seems to be in good physical condition. Through the years he has had many complete physical examinations, with no findings of disease. About eight months ago the aforementioned mass suddenly disappeared, probably retiring into the abdomen. Six months ago I started giving him 25 mg. of testosterone twice weekly. This has greatly improved his nervous condition and his general feeling of well-being. Is it possible that this mass could be a misplaced ovary, complicating his general condition? What is your opinion of this case, and what procedure should be followed?

M.D., Illinois.

Answer.—The mass described might have been a partially undescended testicle which returned to the abdomen. However, the satisfactory results of the patient's physical examination indicates that both testicles were in the scrotum. While it is possible that the patient may be a hermaphrodite, it would seem much more likely that he had a hernia and that there has been spontaneous regression of the hernia and possibly even obliteration of the tunica vaginalis testes, although the latter is not likely.

Since there is no obvious evidence of hernia at present, no therapy is indicated and the patient should continue with his normal work. If evidence of the mass returns, he should be operated on. On the other hand, if the testicle on this side is not present in the scrotum, then he should be operated on immediately and an exploration done to bring the undescended testicle into the scrotum, since the incidence of neoplastic change in retained testicles is definitely higher than in those which are in the normal position in the scrotum.

CHOICE OF AN ANESTHETIC

To the Editor:—What is the safest anesthetic for the usual abdominal operations? What anesthetic gives the patient the best chances of being alive and well and free from cerebral deterioration and spastic or flaccid paralysis?

M.D., Louisville, Ky.

Answer.—The safest anesthetic in the hands of the greatest number of anesthetists and for the greatest variety of patients is ethyl ether given by the semi-open drop method. With respect to the development of cerebral deterioration with spastic or flaccid paralysis afterward, any anesthetic used must be administered so that a pronounced degree of anoxemia is avoided. It is difficult to name an anesthetic and say that one is safer than another unless one knows who will administer the anesthetic. For the person who is familiar with nitrous oxide-oxygen-ether and has not given ether by the semi-open drop method much, the method with which he is most familiar and skilful is the most advisable. The skill of the person administering the agent is more important than the agent itself. One should have sufficient experience to make a wise choice of agent and method. It is best not to use routine methods but rather to fit the anesthetic to the patient. In treating a patient with symptoms of cerebral damage one may use serum albumin to avoid edema of the brain. The method of treatment suggested and used by T. H. Seldon is the best that has been offered. In patients with mild or borderline disease a small dose, 20 cc., has been effective. In patients with pronounced symptoms, as much as 100 cc. every four or five hours for four or five days has been used to advantage.

Reference:

Seldon, T. H., Faulconer, Albert Jr., Courtin, R. F. and Pino, D. M.: Postanesthetic Encephalopathy: The Postulation of Cerebral Edema as a Basis for Rational Treatment, Proc. Staff. Meet., Mayo Clin. 24: 370-374 (July 6) 1949.

BRONCHITIS FOLLOWING SEED DUSTING

To the Editor:—In a man aged 40 bronchitis develops spring and autumn. The onset was three years ago, at the time when he began to treat oats (spring) and wheat (autumn) with ceresan.® Before treating oats and wheat he did not have the bronchitis. Have there been any reports of irritation or allergy to this agent?

J. R. Rieson, M.D., Bryan, Ohio.

Answer—Ceresan® is one trade name for a series of organic mercurial compounds of which ethyl mercuric phosphate is representative. These chemicals, mixed with a higher percentage of inert material such as talc, are dusted onto seeds or bulbs for fungicidal purposes. Some dusting is carried out in the field near the time of planting, but other dusting is inside prior to seed bagging. Potentially, the operation is always dusty. In some instances the admospheric content of mercury is excessive. In at least three foreign countries fatalities have occurred, but United States' experience is much more favorable. Neither dermatitis nor systemic mercury poisoning is known to be prevalent. It may be assumed that any chemical dust that induces a primary dermatitis, if inhaled in appreciable quantities, may also induce inflammation of the upper part of the respiratory tract. Therefore the possibility of chemical bronchitis is not denied, but this is not a common feature of mercury poisoning. If this patient is still or later exposed, suitable examination for mercury poisoning may be desirable. Wholly apart from the effects of any special chemicals, ordinary dusts from large scale seed manipulation are capable of inducing low grade, nonspecific inflammation of the upper part of the respiratory tract.

OIL CYST

To the Editor:—I am interested in any information regarding the treatment of a foreign body reaction due to corn oil in the subcutaneous tissues of the arm, which has remained the same for about three months.

M.D., Indiana.

Answer.—Apparently the patient has an oil cyst or granulomatous tumor (oleoma) in the area of injection. It has been shown experimentally that pure corn oil, injected subcutaneously, causes formation of an oil cyst, around which a foreign body reaction develops. This reaction may increase to the formation of a granulomatous tumor. If enough oil is injected, carcinomatous changes may be experimentally produced.

Cysts may also be formed from subcutaneous injections of such inert oils as peanut, cottonseed, olive and sesame. Early in the experimental investigation of cancer it was discovered that oils containing camphor were carcinogenic; their therapeutic use was immediately abandoned.

More recently similar tumors were reported after injection of estrogenic substance in sesame oil and of epinephine in oil. Treatment of these tumors is always excision of the mass.

ACUTE POLYINFECTIOUS NEURITIS

To the Editor:—Five months ago a housewife of 38 awoke with itching and burning in the extremities, more severe in the legs. For three weeks she had tingling and numbness, and a feeling as though the bones were breaking, more severe in the lower limbs. Deep reflexes were not elicited in the lower limbs but were intact in the upper limbs. Paralysis in the lower limbs became complete within a few days. Examination of the spinal fluid showed a normal cell count and negative Kolmer reactions, with 300 mg. total protein and colloidal gold curve of 0000123433. In the hospital she was given thiamine hydrochloride and physical therapy; in a few weeks the protein was reduced to 170 mg. and the function of the lower limbs returned gradually. Now she can do housework and move around satisfactorily. She had had mumps six months prior to the onset of her illness; she also recalled that she had had impairment of sphincter control. There had been some mental changes as well, since her memory was capricious and she seemed to be apathetic. Two months after her discharge from the hospital the apathy became apparent, although the neurologic symptoms had receded. Her complaint this time was that the ballasts built up (was not prepared, nor had she been in labor), and her menstrual periods were becoming irregular for the first time. On arriving home from the hospital she flowed only two days and stained napkins for three, whereas previously she invariably flowed a full five days. Two weeks after this changed menstrual flow, she again had uterine bleeding, as though she were having another menstrual period. Although there seems to have been an interval of six months between the mumps and the onset of the physical symptoms for which she was hospitalized, the syndrome was regarded as a form of mumps encephalomyelitis. Two months after discharge, when she showed breast and uterine involvement, the presumptive diagnosis of complications from mumps again was entertained. Has such a long period between the mumps and ensuing complication of symptoms been reported? It seems the complications should appear shortly after the mumps. If the breast and menstrual complications are due to mumps, what type of treatment is advisable?

M.D., California.

ANSWER.—Loss of reflexes and paralysis with normal cell count and high protein in the spinal fluid are characteristic of the Guillain-Barré syndrome (acute polyinfectious neutritis). The fact that the function of the lower limbs returned is supportive evidence of such a diagnosis. Complaints made two months later might possibly be explained as of a menopausal nature. No instance is known in which meningoencephalitis has resulted from mumps six months after an attack of the disease. However, menstrual disturbances have been attributed to mumps long after the disease occurred. Usually the complications of mumps closely follow the acute attack. Meningoencephalitis may be present before there is any evidence of parotid swelling.

LOW DIASTOLIC BLOOD PRESSURE

To the Editor:—I have a 76 year old patient whose general health is good for a man of his age but with a blood pressure reading (Tycos instrument) of 135 systolic and 15 diastolic. What may this low diastolic condition indicate, and what type of therapy is suggested?

M.D., Virginia.

ANSWER.—On the basis of the data supplied the most probable conclusion is that this elderly patient has a relative aortic regurgitation due to senile sclerotic dilatation of the root of the aorta and stretching of the aortic ring so that the valve leaflets can no longer seal the orifice during diastole. The diastolic murmur which accompanies these changes is frequently soft and heard with difficulty. Left ventricular hypertrophy is seldom conspicuous when the increased burden begins late in life. These conclusions can be confirmed by fluoroscopic study of the cardiac and aortic masses. This syndrome is not uncommon in the aged. A second possibility is that the diastolic tension may have been recorded at the fifth phase (cessation of sound) instead of at the fourth phase (muffling of tone). In patients with sclerotic vessels this may introduce an error of 10 to 50 mm. of mercury in the determination of the diastolic level. Therapy is not indicated so long as cardiac competence is maintained. The coronary circulation is benefited rather than handicapped by the high pulse pressure.

PREGNANCY AND POLIOMYELITIS

To the Editor:—A patient aged 25, two and a half months pregnant, has contracted anterior poliomyelitis. What are the possibilities of fetal neuromuscular damage? Her first child had mongolism and the second one was normal. If there is a possibility that this fetus may be deformed I would consider terminating the pregnancy. Please advise.

M.D., Illinois.

ANSWER.—A child whose mother has poliomyelitis is unlikely to be born with any deformity due to that disease. There have been many instances of poliomyelitis occurring during early pregnancy with normal children being born. Harmon and Hoyne (Poliomyelitis and Pregnancy, THE JOURNAL, page 185, Sept. 25, 1943) reported that the poliomyelitis virus does not pass the placental barrier.

FUNGUS INFECTION OF NAILS

To the Editor:—I have an obstinate fungus infection (ringworm) of the nails, nail grooves and tips of the fingers. The usual treatments, including irradiation, have been beneficial but have not effected a permanent cure. Please outline a course of treatment.

M.D., New York.

ANSWER.—Fungus infections involving the nails may be due to one of several fungi. In the present instance, if there is paronychial involvement, the condition is probably moniliasis due to Candida albicans. To determine the exact organism responsible, direct examination and culture on Sabouraud's mediums of scrapings from the nails and skin should be done. In view of past treatments, the organism may be difficult to isolate. Demonstration of fungi is important in determining treatment and prognosis.

Treatment of fungus infections of the nails is often ineffective. It would be helpful if more details were available concerning the irradiation therapy and other previous treatment. Assuming that the condition is due to a recalcitrant fungus infection, a course of treatment with ammoniacal silver nitrate solution can be tried. The solution may be obtained ready for use from any dental supply house. It may be applied once weekly, for at least eight treatments, as a thin film to the affected nails by means of a toothpick first dipped into the ampul of ammoniacal silver nitrate. The solution may also be applied to the involved skin, provided there are no fissures or weeping. The treated areas will turn black and remain so for about a week. There should be no unfavorable reactions. Evidence of healing will be shown by growth of healthy unstained nail. As the focus of infection is probably in the nail, once the nails are clear the skin should respond more readily to other therapy if necessary.

INTERMITTENT ASPERMIA

To the Editor:—A 33 year old patient with neurotic, obsessive traits, including miserliness, has been married about a month and states that after abstinence of three or four days from sexual intercourse he notices no ejaculatory secretions in the condom, although orgasm has occurred. This situation is not the rule but has occurred a sufficient number of times to worry him. Can psychogenic factors cause this condition?

M.D., Indiana.

ANSWER.—Apparently from the history this patient has intermittent aspermia. It may be that the semen goes into the bladder instead of out of the urethra. This could easily be determined by having the patient void immediately afterward and then examine the urine to see whether it contains semen. If no semen is present a urethroscopic examination should be done and a roentgenogram made of the prostatic region to eliminate the possibility of prostatic stones. If these examinations reveal no abnormalities, the patient should seek advice of a well qualified psychiatrist.

TONSILLECTOMY

To the Editor:—In a 6 year old child a moderately enlarged tonsil was removed, but later the capsule was discovered still in place. What is the after effect of leaving a capsule in place if all tonsil tissue is cut? Is it possible to destroy the capsule postoperatively?

M.D., Texas.

ANSWER.—The retention capsule of the tonsil, which consists of fibrous tissue, would not cause ill effects if the tonsil tissue is removed. While as a rule the removal of the capsule will cause no ill effect, nevertheless it may be destroyed by electrocoagulation. A 6 year old child probably would not cooperate unless completely anesthetized. It is obvious that it would not be discreet to disturb the capsule unless definitely indicated. It is conceivable that the tonsil and capsule were so completely removed that the capsule covering the muscles of the anterior and posterior pillars are brought into view and are thought to be the tonsillar capsule. It would seem wise not to operate solely to remove the capsule unless there are symptoms of irritation or discomfort.

BLOOD TRANSFUSION AND ANESTHESIA

To the Editor:—Is it advisable to give blood transfusion while the patient is anesthetized? Since there is the human element in typing the blood, an error may occur and the patient, being anesthetized, would not react.

J. Louis Waldner, M.D., Loveland, Colo.

ANSWER.—Although it is difficult to recognize an untoward reaction with the patient under the effects of a general anesthetic, if blood transfusion is indicated and if an accepted and satisfactory laboratory investigation has been made on the donor and recipient, there is no apparent reason why this therapeutic procedure should not be performed.

ROCKY MOUNTAIN SPOTTED FEVER

To the Editor:—An 8 year old girl became ill while visiting in Llano, Texas. A local physician made a diagnosis of influenza. The child was given sulfadiazine, and immediately rather severe nausea and vomiting developed. Her temperature reached 103 F., after a few days the general supportive care it decreased to 99 F., but it never became completely normal. The child felt well for three days and then had talking temperature which reached as high as 107.6 F. She was placed in a local hospital where a clinical diagnosis of relapsing fever was made without laboratory confirmation. The temperature decreased in three days to 100 F., remained there for two days, then rose to 104 F., remaining so for twenty-four hours, and again declined. The child was then given intravenous injections of neoarsphenamine and returned to San Antonio. A chest roentgenogram did not reveal signs of disease, and physical examination did not produce significant findings. The urine was normal, hemoglobin 13.9 Gm., red blood cell count 4,980,000, white cell count 6,400, with 62 segmented forms, 35 lymphocytes, 1 monocyte, 1 eosinophil, 1 basophil, and 6 atypical lymphocytes. The following agglutination tests gave the results shown: typhoid "O," positive, 1:160; typhoid "H," positive, 1:640; paratyphoid "A," negative; paratyphoid "B," positive, 1:160; typhus, positive, 1:180, and heterophil agglutination, negative. There were no Proteus OX-K or OX-Z and no brucellosis or tularemia organisms. The patient was immunized for typhoid in December 1948. Her temperature ranged from 99 to 103 F. for four weeks. The patient was given aureomycin 0.5 Gm. every six hours, and during the period of five days that she was able to take this drug her temperature ranged from 98.6 to 100 F. At this point nausea and vomiting forced discontinuance of aureomycin therapy. Her temperature continues to be 99 to 100 F. at this writing. This child had frequent contacts with ticks preceding her illness. I would appreciate suggestions for diagnosis and treatment.

John H. Behnfeldt, M. D., San Antonio, Texas.

ANSWER.—On the basis of the laboratory reports presented, epidemic typhus might appear probable. However, the laboratory observations are not incompatible with Rocky Mountain spotted fever. Therefore, it seems more likely that the patient contracted Rocky Mountain spotted fever from a tick rather than epidemic typhus from a louse. It is assumed that "typhus, positive, 1 : 180," refers to Proteus OX-19; the reaction would also be positive for Rocky Mountain spotted fever. The fact that the titer for Proteus OX-19 is low may perhaps be explained by the duration of the disease or treatment that has been administered. Aureomycin therapy seems logical. If the new preparation of this drug for intravenous therapy is used, the nausea and vomiting which has resulted from its administration previously may be avoided. However, the danger of thrombosis must be considered.

PROFUSE PERSPIRATION BEFORE MEALS

To the Editor:—An elderly man has attacks of profuse and unnatural perspiration of the head only, which occur regularly twice a day. The first attack comes just before lunch, lasts through the meal and subsides afterward. There is no further trouble until just before dinner, when there is an attack that lasts throughout the meal. The perspiration is so copious that water runs down the face, into the eyes and down the collar, soaking a handkerchief. The flow can be controlled and often eliminated by the use of a belladonna preparation (belladenine,® 0.25 mg. tablets) fifteen or twenty minutes before the attack starts, but it does not seem advisable to use this continuously. Stopping one attack has no effect on the next. The condition has lasted six or eight months and shows no signs of improving. Have you any suggestions as to therapy?

Wade F. Basinger, M.D., Philadelphia.

ANSWER.—The limitation of sweating to the head and its association with food taking suggest that this is a derangement of the phenomenon known as "gustatory sweating" (*Arch. Neurol. & Psychiat.* 40:443 [Sept.] 1938). The fact that the sweating begins before the patient starts to eat indicates that this is a conditioned reflex, analogous to the secretion of gastric juice when a person thinks about appetizing food. The only treatment that suggests itself other than the present symptomatic use of belladonna is to eliminate the conditioned reflex by psychotherapy.

TOXICITY OF BABBITT FUMES

To the Editor:—What are the hazards associated with the inhalation of Babbitt metal fumes in babbitting machine parts?

M.D., Illinois.

ANSWER.—Babbitt's original antifriction alloy represented 4 parts copper, 8 parts antimony and varying parts of tin up to 96. Later, the term babbitt became general for numerous alloys for machine bearings, but all contain copper. A modern formula approximates the following: zinc 69 per cent, tin 4 per cent, copper 3 per cent, lead and antimony up to 100 per cent. Some babbitts contain a much higher percentage of lead. The chief hazards are metal fume fever and plumbism from zinc and lead, respectively. Copper and tin are comparatively harmless in industrial pursuits. Antimony, although toxic, only seldom has been implicated in occupational disease experience.

NYLON STOCKINGS

To the Editor:—A white woman aged 63 suffers from obesity and hypertension. I gave her choline, ½ Gm. three times daily. She was also given a low sodium, low calory diet. After beginning the choline therapy she reported that her leg swelled and showed small pinpoint eruptions; she claimed that blood exuded from each site of eruption, and that wherever blood exuded it dissolved small holes in her nylon stockings. Could you give me any information about this?

Bernard E. McGovern, M.D., North Hollywood, Calif.

ANSWER.—Wherever the claim has been made that nylon stockings have been chemically damaged while in use, it commonly develops that this may have been due to atmospheric contaminants such as sulfuric acids. It is possible that this may account for the present occurrence. It is unlikely that either the administered choline or blood serum may have directly brought about this happening. Possibly the serum on the stockings may have served as focal points favoring the accumulation and concentration of air contaminants. However, the buffering properties of blood militates against this assumption. In any event, greater consideration should be directed to external agents rather than to exuded blood.

VITAMIN E FOR MENOPAUSE

To the Editor:—I have heard that vitamin E can be used in place of estrogens. If so, what is the equivalent dosage?

M.D., Illinois.

ANSWER.—Use of vitamin E (synthetic *d,l*-alpha tocopherol acetate) has been studied in the last three years in a series of women suffering from the usual symptoms of the menopause. The results are reported to show satisfactory relief of symptoms in about two thirds of the women studied. The dosages which are reported vary from 25 to 100 mg. daily. The material has been used orally. However, it is definitely established that the alpha tocopherol is not estrogenic. Vaginal smears were not altered by the therapy even though the symptoms were completely relieved.

References:

Christy, C. J.: Vitamin E in the Menopause; Preliminary Report of Experimental and Clinical Study, Am. J. Obst. & Gynec. 51:441, 1946.

Finkler, R. S.: The Effect of Vitamin E in the Menopause, J. Clin. Endocrinol. 9:189, 1948.

SOFT WATER FOR INFANTS

To the Editor:—What information do you have on the relation of a rash and soft water in infants?

A. Macedonia, M.D., Steubenville, Ohio.

ANSWER.—As far as can be learned, bathing or washing an infant in soft water does not cause skin eruptions. In the past physicians frequently advised nurses and mothers not to bathe infants suffering from eczema, though more recently oatmeal baths, bran baths and starch baths have proved soothing and healing.

VARICOSITIES OF THE BROAD LIGAMENT

To the Editor:—Do large varicosities of the broad ligament cause any symptoms?

Robert A. Hosbour, M.D., Compton, Calif.

ANSWER.—Large varicosities of the broad ligament usually cause pain in the pelvis and backache.

RESEARCH ON IMMORTALITY

To the Editor:—In *The Journal* for Aug. 6, 1949, page 1191, appears a query from a physician in Tennessee, "Research on Immortality." Scientific studies began on the Continent and in the British Isles before they were undertaken in the United States. The man who investigated the field whom physicians have best ven Alexis Carrel. After he had carried on research at the Rockefeller Institute for some years, somebody asked his opinion and he answered, "The work of a scientist is to observe facts. What I have observed are facts troublesome to science. But they are facts." His manuscript, which was about ready for publication, appears to have been lost at the time of his death during World War II. An American, Walter Franklin Prince, Ph.D. (Yale) wrote, "Human Experiences," (1931), available in many libraries. In England the Society for Psychical Research came into being under such leading scholars as Henry Sidgwick, Sir William Barrett and Frederick W. H. Myers, the last the author of the four volume work "Human Personality and Its Survival of Bodily Death," now abstracted to a single volume and available here. Two quarterly journals appear in many public libraries in America, The Journal of Parapsychology, Duke Univ. Press, Durham, N. C., and The Journal of the American Society for Psychical Research, 880 Fifth Ave., New York 21.

Psychical research presents a hope of shedding light on the exquisite problems of sleep and death. If by psychical research science should establish immortality, an idealistic philosophy of life would then become not only possible but rational.

Sarah Parker White, M.D., Tallahassee, Fla.